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AMERICAN RADIO RELAY LEAGUE, *West Hartford, Conn., U. S. A.*

• EDITORIALS •

Annual Board Meeting

OUR League's Board of Directors meets in Hartford on the first day of May for its annual session. As always, there are many things that must be decided. Now is the time to communicate your views and suggestions to your Division Director. His name and address are on page 6.

Overloaded Plates

THIS is the busiest winter we have ever had at Headquarters. In spite of more people and larger quarters, there's a blue corona over the whole establishment and the insulation is smouldering in several places, trying to carry the load. We wish we had the time and space to tell you of the many interesting things that have been going on, particularly in our government relations. Some of these things, however, can't be discussed in a magazine of general circulation. We do succeed, though, in keeping in close touch with the Directors. We think that this year we've accomplished for amateur radio a thousand times more than you know about — but we can't tell you about it in print. If hard work, clear thinking, the careful manipulation of opportunities, and upright dignified conduct will get an organization anywhere, we're going to get there.

The Government Commences Enforcement

OUT-OF-BAND operation by an irresponsible minority of licensed amateurs has been causing trouble to other services. The Radio Division, Department of Commerce, has finally determined to take action against the offenders. The Grand Island monitoring station is now in service. All of the Supervisors of Radio have been instructed to monitor the amateur bands and proceed against amateurs who are out-of-band. Amateurs thus logged will be given three days to explain why they were on an illegal frequency and to offer what assurances they can that there will be no repetition. If the replies are convincing in both respects, it is probable that the offender will escape penalty that first time. If he "repeats," however, he must expect trouble promptly. The Radio Division, through the Secretary of Commerce, has authority to suspend operator licenses for any period up to two years for violation of any station-license specification or F.R.C. regulation.

It seems too bad that this situation should prevail but for a long time government action has appeared inevitable. Our prestige as a group hasn't been increased by some rather uncomplimentary publicity which the Department of Commerce released to the newspapers on amateur interference. To be safe, *know* that *you* are in the bands.

Coöperation with B.C.L.'s

NO editorial is ever complete. Ours about superheterodynes, in the March number, had for its main job the business of pointing out that B.C.L.'s are likely to experience some interference for which amateurs will not be at fault, and under conditions where the listeners will not be entitled to protection. That editorial couldn't go into everything. There is one point in particular, however, that needs some following up.

Improperly adjusted amateur stations can still cause improper interference. The marketing of some unsatisfactory superheterodynes is not going to clear us of all possibility of blame, even when the complainant uses a super. It isn't possible to relegate all the "bum superheterodynes" to the nearest river, and as a practical proposition if we were so to advise the B.C.L. who had spent his money in good faith for what he presumed to be a modern receiver, the situation wouldn't improve. We have told our story about these receivers to all the Supervisors of Radio. They fully appreciate it and we can count on their coöperation. But we must do our part; we need, as much as ever, to continue that coöperative policy which in the past has always characterized our relations with the B.C.L. in trouble, showing him patiently what's the matter, trying to help him, and in general playing ball with him. Such coöperation always strengthens the amateur's position with the Supervisor. Let's keep it up.

3500 Flat

EVERY once in a while we hear a 'phone station say, with evident self-pride, that his crystal is right on 3500 kc. and therefore he knows he is in the band. Sorry, O.M., it isn't so. The Washington Convention provides that stations assigned bands to work in must work sufficiently distant from the edges of these bands to prevent any interference outside the band. It is obvious that the modulation of a 3500-kc. 'phone extends several kilocycles on either side of the carrier, and to just that extent such a station is "out-of-band." That is precisely the cause of some of the interference on airways channels. Two kilocycles is about the minimum safe allowance for side-bands. One therefore shouldn't hear a 'phone announcing a frequency any lower than, say, 3502 kc.

K. B. W.

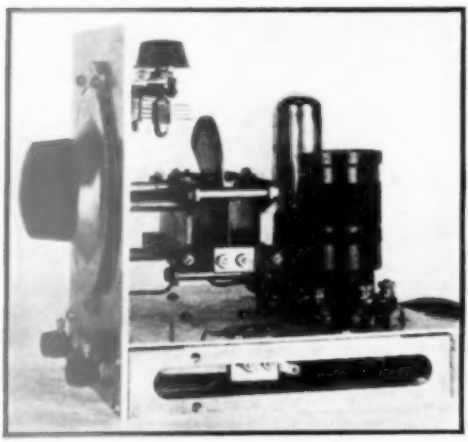
A Harmonic Monitor

Listening to Your Own Signals with Monitor Harmonics

By George Grammer, Assistant Technical Editor

STRANGE as it may seem, some amateurs have been known to remark now and then that their monitors seemed to be untruthful. Why this seeming lack of faith in one of the most useful of instruments? Is there any real basis for casting the eye of suspicion on the station watchdog?

The fact is that no monitor is wholly truthful, because no monitor is perfect. By the same token no receiver is wholly truthful — a lot of them are deceitful to a far greater extent than most monitors. The trouble is more with ourselves than our equipment, because we are inclined to take certain things a little too much for granted. We nonchalantly assume that because a signal as heard in our receiver has certain characteristics that those characteristics are a property of the signal. Because a signal creeps we blame the transmitter; because an a.c. ripple spoils the otherwise pure d.c. of a good note we blame the other fellow's plate supply; because a ham 'phone sounds tinny it must be poor modulation; and so on. Yet any receiver can, and a good many of them do, cause these effects. This accounts, in part, for the variance in reports which a given transmitter will get from different receiving stations.



THE HARMONIC MONITOR

This instrument may be used both as a monitor and frequency meter, as explained in the text. The tube, coil and tuning condensers are above the sub-panel, all other parts being underneath. The midget trimmer condenser is mounted on a brass bracket held to the aluminum front panel by a machine screw. All the r.f. wiring (using rigid bus wire) is above the sub-panel.

Since a monitor is simply a miniature receiver it is quite likely to have the same defects as a receiver. If it is to give a true picture of the signal it must be free from those defects; otherwise ..ne allowance must be made for the imperfections of the monitor. What, then, are the defects and how are they to be overcome?

The first thing to find out is what sort of monitor will give a true picture (perhaps a better word would be audition) of the signal. Obviously it must introduce no peculiarities of its own. Such a monitor will be one which does no creeping; which has absolutely pure plate and filament supplies; and which can neither add to nor subtract from any modulation frequencies which may be present on the transmitter carrier. About the only type of monitor which will fit these specifications is a crystal oscillator with steady battery supply for both plate and filament, either without any audio amplification or with audio amplification which does not reduce the low-frequency modulation of the type caused by plate supply ripple. Such a monitor has decided limitations; it is better to use some other form of oscillator and make allowances for its imperfections.

One bugbear of ordinary monitor construction is that complete shielding is necessary, and in order to keep the thing down to a reasonable size only the smallest batteries may be used. This has led to a crop of monitors built around a Type '99 tube, a "C" battery for filament supply and the smallest size of "B" block for the plate. The batteries function very nicely for a while — not a very long while either — and then the voltage starts to drop off. Monitor batteries seem to have a habit of wearing out just when needed most. Between the good period and the time when replacement becomes absolutely necessary the performance of the monitor is adversely affected. We remember vividly one monitor used to check a new transmitter which led us to believe the transmitter was a terrible creeper — until it was discovered that the monitor filament battery was about worn out and the filament voltage dropped continuously as long as the switch was closed. A new battery proved that the transmitter was actually extremely steady — all the creeping was in the monitor itself.

WHY NOT USE HARMONICS?

Monitor construction is considerably simplified if the shielding is omitted and the batteries used on the receiver operate on the monitor as

well. Of course the monitor cannot in that case work on the same frequency as the transmitter; harmonics of the monitor must be employed for listening. This idea of harmonic listening has not been as largely used as it might have been because the impression seems to have gotten around that

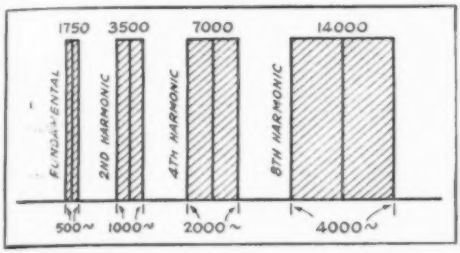


FIG. 1 — WHY HARMONICS CANNOT BE TRUSTED IF ANY FREQUENCY WOBBLE IS PRESENT ON THE FUNDAMENTAL

In this illustration it is assumed that the wobble on the fundamental is 500 cycles; on the second harmonic it will amount to 1000 cycles; on the fourth harmonic, 2000 cycles, etc., because the frequency "band" covered by a given harmonic will be equal to the fundamental "band" multiplied by the number of the harmonic.

a signal picked up on a harmonic does not sound the same as it does on the fundamental. This is often true of the transmitter harmonics, but need not be true of the monitor harmonics.

As an illustration, suppose the monitor is designed to cover the 1750-kc. band. The signal (assuming the transmitter is on one of the three most popular bands) will be picked up on one of the monitor harmonics. These harmonics will be of the same nature as the fundamental, except that any effects present will be multiplied by the number of the harmonic.[1] Let us imagine that because of ripple in the monitor plate supply (there shouldn't be any, of course) or a.c. "induction" from nearby house wiring, there is a slight hum in the monitor which modulates it slightly. Most receivers and monitors are built with as much coil and as little condenser as we can get in them; consequently the frequency-changes with modulation — the well-known "wobbulation" — are comparatively large. The wobbulation on any harmonic is worse than that on the fundamental — in fact, the number of the harmonic multiplied by amount of fundamental wobbulation.

WOBBULATING HARMONICS

Fig. 1 may help make this clearer. Suppose the amount of modulation is such that the monitor frequency wobbles 250 cycles either side of the fundamental, 1750 kc., making a total wobble of 500 cycles. Then on 3500 kc. the total wobble will be 1000 cycles or one kilocycle, on 7000 kc. the wobble will be 2 kc. and the 8th harmonic, 14,000 kc., it will be 4 kc. This wobble takes place at the modulation frequency (about 120 cycles usually, since most house current supplies are 60 cycles) and such a monitor would make the transmitter note sound like mushy r a c. even though it were actually pure d.c. and absolutely steady. The illustration is no doubt somewhat exaggerated, but a similar effect is not hard to obtain in practice.

It is quite clear that such a monitor would be useless for checking the character of the signal, and it is equally clear that all wobbulation must be eliminated if a harmonic monitor is to be of any use in the station. A few attempts to use a.c. tubes in this type of monitor met with scant success, because the small amount of filament hum wrecked the character of the harmonics, although on the fundamental distant d.c. carriers could be tuned in without a sign of modulation. This is no indication that a.c. cathode heating cannot be used successfully with careful hum elimination, however, although it is likely that it will never compare with d.c. heating for this sort of work.

In passing, it is well to mention that a harmonic of the transmitter should never be monitored, no matter how good the monitor itself may be, because of the effect illustrated in Fig. 1. Any

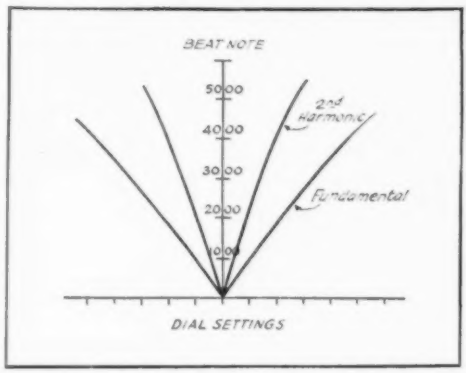


FIG. 2 — THE "DOUBLE-BARRELLED" BEAT NOTE

This effect is obtained when a high harmonic of the monitor beats with a harmonic of the transmitter as well as the fundamental. The higher the harmonic, the more rapid will be the rise in the beat note on either side of zero beat. All beats reach zero simultaneously.

wobbulation present on the fundamental of the transmitter is multiplied by the number of the harmonic used, and when wobbulation is present a true picture of the signal can never be obtained.

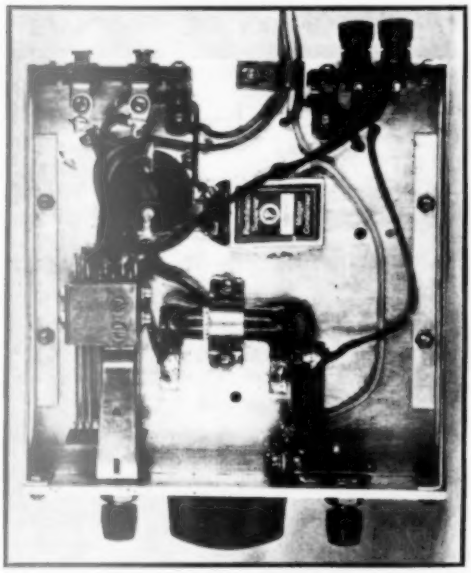
With battery plate and filament supplies for the monitor tube there is little difficulty in wiping out wobbulation. A.c. pick-up from nearby wiring is about the only thing left to cause it, and this can be reduced to a minimum by omitting the grid leak and condenser from the monitor circuit, thus in effect connecting the grid to ground for

[1] See letter from E. G. Watts, Jr., page 37, August 1930 *QST*.

low-frequency a.c. With wobbulation eliminated the harmonics will give just as good results as the fundamental — provided the right harmonics are chosen. This brings up another story.

PICKING THE RIGHT HARMONIC

The monitor should always be tuned so that one of its harmonics is beating directly against



THE SUB-PANEL WIRING

The jack-switch at the left switches the 'phones or audio amplifier from monitor to receiver. The filament switch is at the right. The placement of the r.f. choke, by-pass condenser, and the two resistors is clearly indicated in the photograph. Small bakelite strips at the rear serve to hold a pair of 'phone tip jacks and binding posts, respectively, to which the connections between the receiver, monitor and 'phones are made. The battery connections are brought out to an ordinary battery cable held under a clamp at the rear of the sub-panel.

the fundamental of the transmitter and not against one of the transmitter harmonics. For example, the monitor may cover the 1750-kc. band with some overlap at both ends, and the transmitter may be tuned to 3600 kc. The monitor should be tuned to 1800 kc. so that its second harmonic picks up the signal. A signal will also be heard at 2160 kc. which is the result of beating the fifth monitor harmonic against the third transmitter harmonic; another signal will be heard at 2000 kc. resulting from a combination of the ninth monitor harmonic and the fifth transmitter harmonic. Either of the last two is likely to give a wrong picture of the signal, because of the increased wobbulation on the transmitter harmonics, as explained above.

In practice it is not hard to avoid mistakes of this character because the higher harmonics usually are weaker than the desired one, and the character of the note may not be so good. With a transmitter free from wobbulation, such as a good crystal outfit, there should be no appreciable difference, however. When several harmonics are heard at different points on the dial the correct frequency should be picked out — or the one that sounds the best may be taken as the right one.

The one remaining possibility of error is that of double beats.[1] Taking the same example once more, if the transmitter is tuned to 3600 kc. and the monitor to 1800 kc., the fourth harmonic of the monitor will beat with the second harmonic of the transmitter (on 7200 kc.); the 8th harmonic of the monitor will beat with the fourth harmonic of the transmitter (14,400 kc.) and so on down the line — this in addition to the second harmonic of the monitor and the fundamental of the transmitter, which is the desired combination. Usually only the second beat (fourth harmonic of monitor and second harmonic of transmitter) is strong enough to be noticeable, and when present gives rise to a rather queer effect. As the monitor is tuned through zero beat with the signal, two beat notes are heard, one rising twice as fast as the other, as shown in Fig. 2. The "fundamental" and "2nd harmonic" curves on the drawing refer to the transmitter; on the monitor the "fundamental" curve actually would be the second harmonic in the case under discussion, and the "2nd harmonic" curve is the fourth harmonic of the monitor. The beat note for a given dial setting is always twice as high on the second harmonic as on the fundamental, and when the limits of audibility on the second harmonic are reached, only the fundamental will be heard.

Since the second harmonic of the transmitter may be worse in character than the fundamental, a strong second harmonic indicated by the double beat may make the note sound worse than it is. Even if both fundamental and second harmonic are absolutely pure d.c., however, there still results a rather odd sounding "double-barrelled" note, the difference between it and the fundamental alone being comparable to the difference between a single tone and an octave sounded on a musical instrument. If such a harmonic is present a sufficiently high beat note should be used for checking the signal to put the second harmonic beat so high as to be practically inaudible. The presence of these double beats — they are not always actually bothersome — is the only real disadvantage of the harmonic monitor. For that matter, they can occur just as well on any type of monitor, but when complete shielding is used the pickup on the harmonics will be less.

BUILDING A HARMONIC MONITOR

After all this discussion it's about time to get down to something concrete. The harmonic monitor shown in the photographs was built up after a little experimenting, and has been more than

satisfactory in several respects. The panel height and general construction matches that of the two-tube a.c. receiver described in *QST* for December, 1930. The coil and condenser combination is adjusted to cover the 1750-kc. band, allowing a little extra at the ends. The tickler winding is of such size as to make the tube oscillate strongly over the entire band with 45 volts on the plate, and no regeneration control is used. Only one coil is required, since harmonics as far down (or up) as the eighth are strong enough to monitor signals in any of the three bands.

A wiring diagram is shown in Fig. 3. The ordinary tickler circuit is used, except that the grid condenser and leak are omitted. A triple-pole double-throw jack-switch throws the 'phones or audio amplifier from receiver to monitor and vice versa. Although it is possible to connect the terminals marked "output of receiver" to the receiver 'phone jack and connect the 'phones to the jack-switch blades, a better method is to connect those two terminals to the plate circuit of the detector in the receiver and run the "'phones or audio amp." wires to the primary of the first audio transformer or coupling device. This automatically connects the monitor to the audio amplifier in the receiver when the switch is thrown to the correct position and makes the monitor signal reasonably loud. Listening on the monitor alone, while perfectly practicable, is like using a one-tube receiver. If you like that sort of volume level, all well and good; but most hams prefer something with more pep.

Two more things about this monitor need some explaining. One is the midget condenser C_2, and the other the resistor R_2. These two things are not needed for plain monitoring, but since we have a fairly decent oscillator built up it might as well be used for frequency measurement too. Resistor R_2 is in the circuit simply to replace the 'phones or audio transformer primary when the switch is thrown to the receiver position and thus keep the plate voltage on the monitor tube constant. A 2000-ohm unit is about right for most headsets or audio transformers. Condenser C_2 is a trimmer which allows the oscillator frequency to be adjusted to zero beat with previously logged marker stations and thus allows for day to day corrections in calibration to compensate for drift and battery aging.

A Type '30 tube is used in the monitor shown in the photograph, although any other type of d.c. tube could be used as well. The '30 was used because this monitor was built to be used in conjunction with an a.c. receiver, which in turn was built to get away from the messiness of storage batteries. The tube only draws 60 milliamperes filament current, and is a paragon of quietness compared with the Type '99, since it is practically non-microphonic. The resistor R_1 is used to drop the filament voltage, since dry cells are inconsiderately rated at 1.5 volts per unit, and the filament of the tube only wants two volts. A regular 30-ohm rheostat would perhaps be better than the fixed resistor, because it would permit some regulation of the filament voltage. Two No. 6 dry cells in series furnish the filament current, and at 60 milliamperes drain should last quite a long time. With a d.c. receiver the best plan would be to use the same type of tube in the monitor as in the receiver and run it from the same filament battery.

The tuning condenser is a Cardwell 201-E, which has a movable stator plate to allow adjustment for band spreading. When this type of condenser is used the movable stator plate should be set so that the 1750-kc. band is just

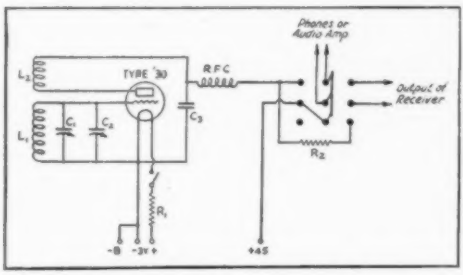


FIG. 3 — THE MONITOR CIRCUIT

C_1 — Tuning condenser, adjusted for spreading the 1750-kc. band satisfactorily. See text.
C_2 — 25-μμfd. midget condenser.
C_3 — .002 μfd.
L_1 — 55 turns No. 30 d.s.c. on 1½-inch form.
L_2 — 16 turns No. 30 d.s.c. on 1½-inch form spaced ⅛-inch from L_1.
RFC — High-frequency r.f. choke. Manufactured chokes are satisfactory, or any of the usual home-made chokes will do.
R_1 — 20 ohms.
R_2 — 2000 ohms.

covered between about 10 and 90 on the dial, assuming a 100-division scale. Any other type of condenser suitably cut down for band spreading may be substituted, of course.

GETTING INTO ACTION

After the monitor is hooked up and ready to go it should be checked for oscillation. If the tube is oscillating a sharp click will be heard when the stator plate of the tuning condenser is touched with a finger. With the tickler size specified in Fig. 3, oscillations were quite strong with 45 volts on the plate. However, different tubes may require a slightly different tickler size, so if the tube refuses to oscillate with that plate voltage a few more turns should be added to the tickler. There should be no tendency towards going out of oscillation at either end of the scale.

After the oscillation test proves successful the strength of the various harmonics should be checked by listening to them on the receiver. The ones of most interest to us are the second, fourth and eighth, covering the 3500-, 7000-,

and 14,000-kc. bands respectively. If the tube is oscillating properly these harmonics will be quite strong — getting weaker as they become higher, of course — and the eighth harmonic should put about an R_1 signal into the receiver. The same "B" batteries are used on both monitor and receiver, and furnish all the coupling needed.

The next test is that of listening to the transmitter. Even a low-power transmitter will put a decently audible signal into the monitor when the former is on the 14,000-kc. band; there is, in fact, less difference in the signal strength with the transmitter on different bands than might be expected. If the transmitter develops a good deal of power and the monitor is placed close to it, there may be a little difficulty in making the pickup small enough to give a good check on the signal. The use of the 1750-kc. band for the moni-

(*Continued on page 72*)

'Phone Gang—All April Contest

WHICH amateur 'phone station gets out the best? Which *are* the really outstanding 'phone stations in each District? — in each A.R.R.L. Section? Who can work the most Sections, and bring in the reports?

To determine the stations with the best all-around performance, 'phone men are invited and requested to keep account of each QSO with a new station, submitting a simple list of contacts, together with QSL's received for the month of April confirming signals worked and heard, so that the best stations operating can be selected, and all participants credited in full for their work. Our results will automatically pick "high quality" 'phones, for as a rule it is only the station with a high percentage of modulation, good quality, and frequency stability, that gets out well. Of course receivers and operating technique in pulling in stations through QRM or under adverse conditions will also count. While the interfering range is limited to the field strength of carriers, the service area or communicating range (voice) varies as a power of the modulation percentage and depends on the quality, too. So it is hoped that in addition to giving everyone a chance to win favorable mention in *QST*, the contest will prove a real incentive to improve equipment and adjustments to make top-notch results possible from the apparatus in use. The whole month of April has been chosen so that no spasmodic QRM above that of normal operation will result, as might happen if only a short period were allowed.

Any and all 'phone bands can be used. We have heard much about 1750-kc. 'phone DX. Moderate power at W9UA-W9BSP and W9AWE has resulted in signals copied on both coasts from these centrally located stations, during two previous seasons. W7ACD recently worked nine states in one night, including W3AC — just a '10 in the output stage, and a single '50 modulator. We look to contest results to tell us more. As for 3500–3550 kc., the return to DX, as indicated by trans-continental work reported elsewhere, and by foreign reports, too, shows some great opportunities for two-way work with remote Sections on this band. Note the chain hook-up of 'phones with *every* district represented too, in considering

(*Continued on page 62*)

C. W. Key Pounders—All April Contest

PURPOSE: To pick the *most consistent* and *reliable* ham telegraph signals in *each* frequency band from *each* Radio Inspection District in the U. S. A. and Canada as well.

Requirements: Only operation logged in April counts. Only "high quality" signals with good notes and frequency stability may be entered. The "number of times heard" will be the factor determining your vote or report on the best signal from each district that you hear. Send in a list of *all* high quality signals *and in each case indicate* the *first* and *second* best stations that can be heard in *each* U. S. A. and Canadian district, (including your own district), tabulating this information by bands for 1750 kc., 3500 kc., 7000 kc., and 14,000 kc. No operator may vote for his own station.

It is to be expected that it will be difficult to log *all* districts on some bands. So any report "as complete as possible" covering signals heard on more than one band (and stating the plate input power used on *your* different frequencies) will be acceptable. Such a tabulation is requested or required from the stations wishing to be considered for a high place in our *QST* report — since otherwise we would have no reports for the BEST stations. Everyone would transmit and none listen.

Factors that will put you in the contest:

1. Send in your report by May 15th.
2. Stations must have a "high quality" signal.
3. The more you operate the greater your chances of a high place in our report.
4. Only operation in April counts.
5. Choice of frequency may determine in what Sections you will be reported consistently.
6. Don't forget to work on 1750 kc. some, if possible. Report on that band anyway — some 2000 mile work has already been accomplished down on that frequency — less competition there may enable you to roll up some outstanding records.

Results will be tabulated for a *QST* report on each of the different frequency bands, with lists of (1) the several *outstanding* stations in the different Districts as heard in *each* A.R.R.L. Section; (2) all high quality signals reported.

— *F. E. H.*

'Phone-Vs.-C.W. Transcon Relay Results

By E. L. Battey, Assistant Communications Manager

YEA Bo! The Transcons are over! The reports have been checked and studied. It is now our pleasure to record more A.R.R.L. History as it has been made by the amateurs taking part in the 'Phone versus C.W. Transcontinental Relay. We have had transcon relays in the past — many of them in fact — but never before has there been so much real wide-awake interest shown as on those three big Sundays in January 1931 — the 11th, 18th and 25th.

The first announcement of the transcons appeared in January *QST* and immediately the royal blood of both the 'phone and c.w. operators began to boil. A 'Phone *versus* C.W. Relay!! "Heck, we can beat that c.w. gang in spite of our crowded band and difficult operating conditions. Let us up and at 'em," came voices from the 'phone men's camp.

"Beating those 'phone men will be like rolling off a log," cried the over-confident c.w. boys. But both sides had lots to learn! These transcons were called "'Phone *versus* C.W." merely to inject a little spirit of competition into the relays. It has been learned from experience in transcons in the past that the spirit of competition does not ordinarily enter into a Transcontinental Relay. Every one is willing to do his bit to get the messages over in as short a time as possible but the spirit of competition, the life of any activity, has sometimes been found lacking. Not so in the Transcons we are recording. No, indeed! There has always been keen rivalry between 'phone and telegraph interests. This dates back to the first days of the telephone, and even to-day commercial telegraph and telephone interests are fighting for supremacy. Likewise, among radio amateurs the operators of c.w. stations have never admitted they could be outdone for an instant by 'phone station operators. 'Phone men would fight until the last gun was fired before they would be belittled by the c.w. men. Such is life!

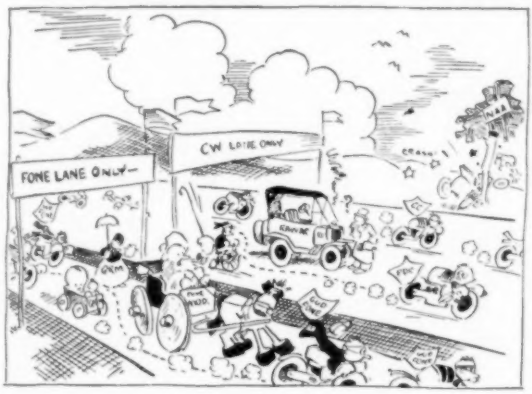
Who won the January Relay? The 'Phone men made a clean-cut victory on the first Sunday, and the c.w. men made a come-back on the last two Sundays. But, read on and see just how these victories were brought about.

Before we go into the real story of the transcons it will be well to review the preliminary line-up so as to get a better understanding of just what was expected in the relay. On each of the three Sundays mentioned, January 11th, 18th and 25th, messages were filed with unknown stations on each coast and were addressed to "Any West Coast Amateur" or to "Any East Coast Amateur," as the case might be. These messages bore special designating numbers assigned by Headquarters for indentification purposes, and were prefixed by the words "'Phone Transcon" or "C.W. Transcon" indicating that the messages must be handled either exclusively by voice, or exclusively by telegraph. The special numbers were made of six characters, two numbers, four letters, two numbers; for example, one of the

messages started by VE1DQ carried the number 18CHUS59. Operation during the relay was confined to the 3500-kc. band only. Any relays made outside of that band did not count in the transcons. The closing time was 11:30 p.m. local time. While messages were *supposed* to reach their destination across the continent before sundown the closing time was extended to 11:30 p.m. local time to make operating interesting for early evening operators on each of the dates in question. At 11:30 all messages stopped wherever they happened to be. When the messages got through to the coast the recipient was allowed to start an answer back to the starting station, although it was not necessary that an answer be returned to make the relay a "closed transcon hop." As the word "transcon" implies, we only wanted the messages to get to the opposite coast. However, when answers were started back it made operation more interesting, and it was real exciting to try to get a message over and an answer back before the closing time. The reply messages bore the same serial numbers as the original transcon received. The texts of all messages (both those originally started and the replies) were in plain language and were signed by the name and call of the operator originating them. The texts of the original messages averaged twenty-five words. The above covers quite fully how things were organized and what was going on. Now we can go ahead and see what happened during the excitement.

We cannot arrive at any conclusions without first taking into consideration the comparison

of conditions as they exist on the opposing teams — 'phone and c.w. The first and most impressive thing that comes to mind is the matter of frequency. As mentioned before, the 3500-kc. band was used. This band extends from 3500 kc. to 4000 kc., a total of 500 kc. Of these 500 kc. the 'phone men have only 50 kc. in which to operate. The c.w. men have the remaining 450 kc. The tremendous handicap to the 'phone operators is immediately apparent. The 50-kc. 'phone band is, under ordinary conditions, very much overcrowded, but during the transcons, with stations that are not on the air regularly getting on to help out in the relay, operating conditions were in such a state of confusion as to give any normal amateur a "QRM headache." It was only by the splendid coöperation of the 'phone operators in "standing by" while other stations cleared their messages that the 'phone men were able to make any successful relays. They showed more clearly than has been shown for a long time what real amateur coöperation can do. All right then, the first big handicap for the 'phone men was their narrow band. There was another. There were many more c.w. stations in operation than there were 'phone stations, and these c.w. stations had a band to work in in which they could spread out a bit. Naturally the more stations in operation the better chance of getting messages across. Another point is that many of the c.w. operators were normally "traffic handlers," and the relaying of messages was nothing new for them. Most of the 'phone operators, however, discouraged from handling traffic by their narrow band, have had but little experience in "pushing traffic." In only one point did the 'phone men have the "edge" on the code men. This was the only good feature of the narrow 'phone band, too. A 'phone station could call "CQ Transcon" and have perhaps 25 to 30 stations come back at him. The band was so narrow that any one listening there was pretty sure to hear him. There was evident in the 'phone band a much better picture of "community spirit" than has ever been noticed in the c.w. ranks; and this was principally because the band was narrow enough for every one to hear every one else.



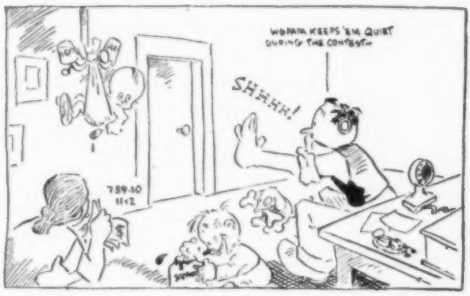
The reports came in unusually well, thanks to you fellows, and we have been able to find complete data on the best part of the messages. There was so much information sent in that we found it was impossible to take each message separately and explain every little thing that happened to it. That would take about half the pages in *QST*. We wanted to show very completely the routing on every message, the number of miles it traveled, how long it took to get that far, and a lot of other dope, but we didn't have the space to write out this information relative to every message. As a way out we hit upon presenting the data in tabular form. The complete journey of each transcon over the principal route is traveled is explained in the tables. Many of the messages got off the main routes and took "side trips." These side trips are described under the heading "Alternate Routes" in another part of this article.

THE SUMMARY TABLES

An explanation of the tables showing the main routes is in order. Don't they look statistical? You bet, and they are statistical. Just follow this description of the headings in the tables and you will agree. There are really two distinct groups, the 'phone messages, and the c.w. messages. They are all arranged by Sundays and in order of high averages. The first heading "Number and Starting Time" consists of the number of each message and the time it left the starting station. In the case of west-bound transcons this starting time is always given in Eastern Standard Time, and in the case of east-bound messages the time is always Pacific Standard. When the starting time is not definitely known, it is given as being the average starting time for all messages on that particular Sunday followed by a question mark to indicate that this time was not reported by participants. The next heading, "Routing," shows every station on the main route over which the message traveled. The starting station and the station on the opposite coast receiving the message are underlined. Likewise, if the reply message got back to the starting station, this station is underlined. In some cases the replies were addressed to "Any East Coast Amateur" or "Any West Coast Amateur" instead of to the originating station. In this case, if the reply reached the opposite coast, the receiving station is underlined. The third column headed "Time" shows the time the message was being relayed and "total time." First: (a) if a message reached the coast; (b) if a message reached the coast and a reply was started back, getting part way back

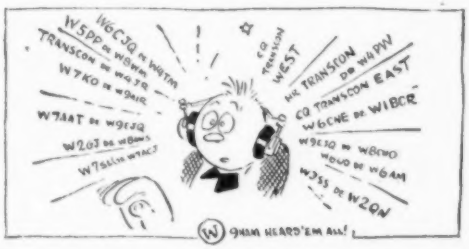
before the closing time; or (c) if a message reached the coast and a reply was received back at the starting station, the route was considered "closed" and the time is figured from the starting time to the time the message stopped traveling. Second: if a message did not get to the coast it was headed for, but died enroute, the time is figured two ways. (1) Since every message had until 11:30 p.m. local time to get across the continent, messages not succeeding were penalized out of fairness to the other routes. Therefore, the time is figured from the starting time to 11:30 p.m. local time at the last station on the route, and the total time thus figured is used in grading the message. (2) So that stations on the incomplete routes may see the number of hours that the message they handled was *actually traveling* we are showing this time in brackets. When the last station on the route did not report the time the message was received, no "traveling time" could be computed and a question mark is shown enclosed in the brackets, indicating this. The fourth heading, "Total Miles," is the number of miles that the message actually traveled. This total was arrived at by finding the distance between all points along the route. Whew! That was an *awful* job! Who ever heard of Sleepy Eye, Minnesota; Medicine Park, Oklahoma; Broken

Bow, Nebraska; etc.?? No, luckily we did not have to look up Podunk. The next column shows the "Number of Relays" and is self-explanatory. The "Miles per Hop" is merely the total miles divided by the number of relays. Next comes the "Miles per Hour" column. We never realized before how fast amateur traffic really moves! The last column headed MR^2/T shows the actual value of each message to its respective side ('phone or c.w.). How was a transcon message to be graded? Considerable study was given this subject. Many trial methods were tested. The factors to be considered are of course the time, the number of relays, the total mileage covered, and the accuracy. The question of accuracy was considered at some length and it was finally found that both sides (c.w. and 'phone) exhibited an equal amount of accuracy in handling messages. This may blast the opinions of some of the c.w. men, who believe there is nothing as accurate as telegraphy, but in this relay, at least, there seems to be an equal amount of accuracy displayed on both sides. Therefore accuracy was not considered in grading the routes. Since this was a "Relay" the number of relays, or in other words the number of stations through which each message traveled should receive special consideration. A route from an east coast station to a west coast station and back again (two hops) is



not, strictly speaking, a relay, because there is no intermediate relay point. Such routes had to be dealt with so that routes with more relays would, on a comparative basis, receive as much, if not more, credit than these "two hop" routes. There had to be some method to amply credit the number of relays. Of the several methods tried, the relation MR^2/T (the total miles x the number of relays squared ÷ the time in minutes) was arrived at as being the most satisfactory and fairest way to all to credit each message. The result of this formula for each message is shown in the last column. This figure of merit successfully credits *multi*-relay routes. That completes the table. By examination of the information on any given message and a study of the alternate routes (described elsewhere), if it happened to get onto a side route, you will get a complete summary of the results and the travels of that message.

By using the figure of merit shown for each message in the tables we were able to arrive at definite conclusions as to which side won the relay on each of the three Sundays. The scores



shown below are figured first on the basis of the number of messages that actually started, and second on the number of messages that were filed with each side to be started. In both cases

'phone wins the first Sunday and c.w. the last two Sundays. The scores were figured by totalling the figures of merit for all the messages on a given side for each separate Sunday and dividing that total by the number of messages started, or the number of messages filed. The results of this computation are shown below.

SCORES

Date	*Based on Number Messages Started*		*Based on Number Messages Filed*	
	'Phone	*C.W.*	*'Phone*	*C.W.*
Jan. 11	352	233	240	181.8
Jan. 18	291.5	666	255.5	559
Jan. 25	670.9	2040	610	1594

The following table shows the number of messages filed with each side on each Sunday, the number of those messages that actually got under way, and the percentage of the filed messages that were started.

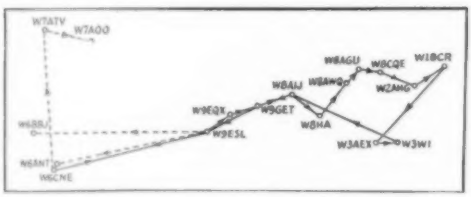
NUMBER MESSAGES FILED AND STARTED

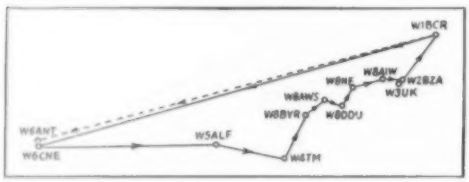
Date	*Started*		*Filed*		*Per Cent Started*	
	'Phone	*C. W.*	*'Phone*	*C. W.*	*'Phone*	*C. W.*
Jan. 11	15	18	22	23	68.2	78.3
Jan. 18	7	21	8	26	87.5	80.8
Jan. 25	10	17	11	23	91	73.9

Actual happenings on the air on the three Sundays of the Relay will undoubtedly be of as much interest to every one as any other section of the results. We shall try to present a few "high spots" gleaned from the reports submitted. These will be arranged by Sundays and in two groups, 'Phone and C.W.

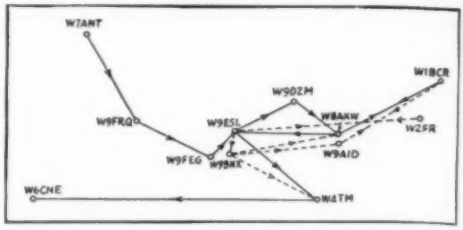
WITH THE 'PHONES ON JANUARY 11TH

On the first Sunday, twenty-two messages were filed at as many stations. Of these twenty-two, fifteen got under way. Three 'phone messages (W3WI's, W1BCR's and W7ANT's) got across





the continent and back in a shorter time than *any* c.w. message. W3WI's message rates the highest due to the mileage, although W1BCR's made the best time, getting over to W6CNE and an answer back by 2:17 p.m. E.S.T. W1BCR was at the mike continuously from 5:00 a.m. until 11:30 p.m., the closing time. The success of the

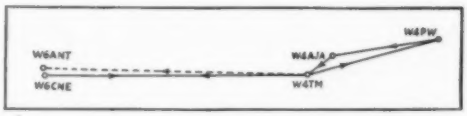


transcons on the 'phone side on the first Sunday may for the most part be attributed to W1BCR's perseverance. He acted as a "key point" in the east, collecting the majority of the west bound messages and pushing them along. In the case of his own message, he shot it out direct to W6CNE — mighty nice DX for 3500 kc. 'phone! We quote from a letter from W1BCR: "The 'phones stood by f.b. with a few exceptions in the early a.m. Credit should be given to the midwest boys who stood by and called the interfering stations and asked them to stand by. A partial list of the 'phone stations that were real active on the first Sunday is as follows: W9AID, W9EWX, W8DRI, W9ESL, W4HN, W4TM, W6ABF, W6CNE, W2AMB, W2GJ, W2BZA, W2AIH, W2AHG, W1CMP, W1AHB, W1CZ, W1AUY, VE1DQ, W8AWS, W5ABO, W5ALS, W8BYR, W8DDU, W8NE, W8AIW, W3UK, W3AEX, W8AGU, W8CQE, W3WI, W4PW, W3AKX, W3BAC, W5PP, W9BNX and numerous others I do not recall." It was the excellent coöperation mentioned by W1BCR that brought victory to the 'phone men in the first relay. The splendid teamwork used in "piping down" stations not having Transcon messages in order to facilitate the movement of traffic all the way across the continent went a long way towards getting those three messages over the back in a shorter time than any other transcons. W8AWS, who had a hand in relaying W1BCR's message and several others writes, "We were on the air continuously from January 10 at 10:30 p.m. until 12:00 noon on the 11th. We did our best to keep the channels clear for the transcons and most of the stations coöperated in a wonderful manner." W4HN had some hard luck and was unable to get his transcon off. He was in contact with W1BCR up to thirty minutes before sunrise when his grid leak went "on the bum," and he had no means of repairing it at once. He later tried to QSP to an "8," but was unsuccessful because his low power would not penetrate the QRM. He made a noble attempt, nevertheless. Several cases were reported where stations at half-way points came to the rescue when two stations in communication lost each other due to fading or QRM. This was the case when

W9FEG at Hutchinson, Kansas, heard W9FRQ, Ft. Collins, Colorado, trying to get a message through to W9ESL. W9FEG stepped in and offered to relay, supplying the missing link and getting the transcon to W9ESL. W2FR was on the job copying *every* Transcon he heard in case he might be called upon to help. He did actually handle W7ANT'S message. W6GM writes, "The four Southern California stations with messages to start all tried to QSO east at once, with the result that no one was successful. W6BBJ at Oakland was QSO W7ATV, who was QSO W7ANT in Great Falls, Montana, who in turn had a "4" standing by. All our messages went via W6BBJ. W6ABF relayed my message to W6BBJ due to poor contact direct from here. I enjoyed the fun very much." W6BBJ reported that after sunrise on the west coast it was so late in the morning eastward that the west coast stations had a difficult time pushing their messages east. At about four or five o'clock in the afternoon W2BZA's power transformer on his speech amplifier went west. It had been working overtime and just couldn't stand any more! This put W2BZA off the air for the remainder of the day — much to his regret. From W7ACJ's report: "The transcons created more interest than I have ever noted before, and as a result the 'phones here in the northwest were on the air from early Sunday morning until late that night."

WITH THE 'PHONES ON JANUARY 18TH

It was found that twenty-two messages as filed on the 11th overloaded the narrow 'phone band, and at the request of the 'phone operators, only eight messages were filed on the 18th. Of these, seven were started. Also, it was found that by the time sunrise occurred on the west coast, it was very nearly full daylight over the rest of the country. This was a big handicap to all west coast starting stations, especially in view of the fact that the east coast starting stations had darkness over practically the whole route. In view of these facts the west coast starting stations were allowed to start their messages one hour before sunrise on the 18th. Even in view of this concession west coast messages did not get very far as is shown in the tables. W6BBJ was unable to do more than get his message to W7ATV at Chehalis, Washington. Due to illness, he was unable to spend much time on the air. The following side-light is quoted from a letter from VE1DQ: "Every credit should be given W1CMP to whom I gave my message. He showed excellent operating ability — skill that many old c.w. traffic men might well be proud of — in getting my message through very heavy QRM at his end. Close watch was kept at VE1DQ all day until 5:00 p.m. A.S.T. No trace of reply was heard." W4PW's message made the best time this Sunday getting over and back in *56 minutes!* W4TM acted as a relay point in the route this message took. In this and several other cases he shot the message right out to W6CNE in Hollywood. From W2HY we have the following, which is very regrettable to say the least — "Unable to hear any east bound messages due to malicious QRM." While the reply messages were supposed to have a different text than the original message,



the reply to W4PW's transcon was worded the same as the original. This was counted in the relay as though it had borne a different text.

WITH THE 'PHONES ON JANUARY 25TH

The special concession to the west coast starting stations in permitting them to start their messages one hour before sunrise on the 18th was found to be insufficient, so on the 25th they were instructed to put the message on the air *two hours* before "Old Sol" crept over the horizon. This helped a bit more, although only one west coast transcon, that started by W6KT on 14 mc. (see alternate routes) reached the east coast. Eleven messages were filed, ten of which were started.

W4PW's transcon made the best time on the 25th, completing the round trip in *32 minutes.* This was the best time made by any 'phone message. W3UK's was second best, going over and back in *48 minutes.*

We quote W8WM — "The 'phones are just about organized for Transcons now. Let's have some more." W1AFQ says, "QRM was terrible at the starting hour here in the East. I worked over an hour to get my message away from Cape Cod, and there seemed to be difficulty all along the line in putting the bulk of the messages across." The malicious interference of certain second district 'phone stations attempting to "gum up" the relay was reported by W3UK and several others: "W2TP . . . refused to coöperate and was on the air all day long QRMing as much as he could . . . also W2ADI . . . W2TP was on W5ABO's frequency, W2ADI was on W6CNE's frequency. . . . " The fact that complaints on these 'phones were received only from the metropolitan area, indicated that the interference caused was, after all, confined to a limited radius about the stations mentioned. W7ACJ reporting on the relays said, "Conditions on 3500 kc. have not been good here for the past three months. My 'phone worked direct with the east coast last winter at this time. We have some good 'phones here in the northwest with good operators, but we could not handle our messages as we would have liked to due to conditions. However, coöperation was very f.b. and the relay was a success."

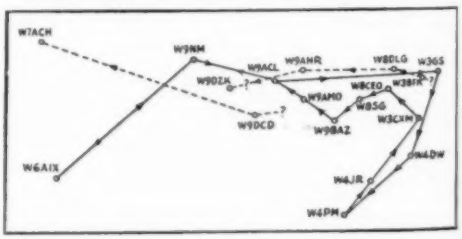
NUMBER & STARTING TIME	ROUTING ('PHONE)	TIME	TOTAL MILES	NO. OF RELAYS	MILES PER HOP (Approx.)	MILES PER HOUR	$\frac{M \cdot R^2}{T}$
JAN. 11 29TZEYI7 7:30 A.M.	W3WI-W8AIJ-W9GET-W9ESL-W6CNE-W9ESL-W9EQX-W9GET-W8AIJ-W8HA-W8AWQ-W8AGU-W8CQE-W2AHG-W1BCR-W3AEX-W3WI (See alt. routes.)	9 HRS. 20 MINS.	5715	16	357	613	2615.
11XDIC91 7:35A.M.	W1BCR-W6CNE-W5ALF-W4TM-W8BYR-W8AWS W8DDU-W8NE-W8AIW-W3UK and W2BZA-W1BCR (See alt. routes)	6 HRS. 42 MINS.	5290	10	529	789	1310.
57INAY98 7:55 A.M.	W7ANT-W9FRQ-W9FEG-W9ESL-W9DZM-W8AKW-W1BCR-W8AKW-W9ESL-W4TM-W6CNE. (See alt. routes)	12 HRS. 55 MINS.	5935	10	594	458.	765.
18CHUS59 9:15 A.M.	VE1DQ-W1CZ-W1AUV-W1BCR-W8ACI-W8UR-W8BXW-W8ANG-W8WM-W8AJH-W9AGX---?	[?] 15 HRS. 15 MINS.	2120	10	212	139.	232.
48UAFZ36 8:48 A.M.	W4PW-W4AJA-W4TM-W5ZS-W5BLW-W4TM-W6CNE-W5PP - Died.	15 HRS. 37 MINS.	4315	7	616	276.1	225.5
22DIVT63 8:30 A.M.	W2AIH-W8AEO-W8HA-W8AIJ-W9FEI-W9EXC-W9BPQ ---? (See alt. routes.)	[5 HRS.] 16 HRS.	780	6	130	[156] 48.7	29.2
34YEJDI4 8:00A.M.	W1AUV-W3AKX-W8BXW-W8AIJ-W9GET-W9CRR-?	[?] 16 HRS. 30 MINS.	1080	5	216	[?] 65.4	27.3
40GLYW81 7:45 A.M.	W6GM-W6ABF-W6BBJ-W7ATV-W7AOO---?	[1 HR. 15 MINS.] 14 HRS. 45 MINS.	1288	4	322	[1030] 87.2	23.3
11SYDX99 8:15 A.M.	W2BZA-W8AKF-W3BAC-W8DDU-W8CKG-W9EMF-?	[3 HRS.] 16 HRS. 15 MINS.	645	5	129	[215] 39.7	16.5
03MPEC44 7:25 A.M.	W6BIU-W6BBJ-W7ATV-W7AOO-?	[1 HR. 35 MINS.] 15 HRS. 5 MINS.	1230	3	410	[777] 81.5	12.2
17NQFD58 7:35 A.M.	W6CRK-W6BBJ-W7ATV-W7AOO-? (See alt. routes)	[1 HR. 25 MINS.] 15 HRS. 55 MINS.	1250	3	416	[882] 78.4	11.8
12AFSQ54 8:27 A.M.	W1CZ-W1AUV-W1BCR-W2BZA-W3SS---?	[48 MINS.] 15 HRS. 3 MINS.	710	4	177	[988] 47.2	11.4
58ZFKE38 8:10 A.M.	W6BBJ-W7ATV-W7AOO-?	[50 MINS.] 14 HRS. 20 MINS.	910	2	455	[1092] 63.4	4.3
27EJWU68 7:30 A.M.	W6ABF-W6BBJ-W7ATV-?	[43 MINS.] 16 HRS.	940	2	470	[1303] 58.7	3.9
89WCHB77 8:10 A.M.	W2GJ-W8AWS-W9GET (died 8:55 A.M. C.S.T.)	[45 MINS.] 16 HRS. 20 MINS.	720	2	360	[960] 44.0	1.5
JAN. 18 64CINH45 7:49 A.M.	W4PW-W4AJA-W4TM-W6CNE-W4TM-W4PW- (See alt. routes)	56 MINS.	4370	5	874	4670.	1950.
68DJXI49 7:23 A.M.	W4HN-W1BCR-W8AGU-W8CUV-W8WM-W9EO-W9GGH — ?	[3 HRS. 11 MINS.] 17 HRS. 7 MINS	1800	6	300	[577] 105.	63.2
59AGLF39 7:55 A.M.	VE1DQ-W1CMP-W8AWS-W9PH — ?	[42 MINS.] 16 HRS. 35 MINS.	1425	3	474	[2190] 86.1	12.9
61BHMG41 7:25 A.M.	W2HY-W8RL-W8BKE-W9BHM-(W6UZ) (Last hop on 14 m.c.)	[2 HRS.] 17 HRS. 5 MINS.	660	3	220	38.7	5.8
866MAL68 6:40 A.M.	W6BBJ-W7ATV-W7ACJ-(died 7:50 A.M. P.S.T.)	[1 HR. 10 MINS.] 16 HRS. 50 MINS.	880	2	440	[758] 52.2	3.5
79FLZK61 10:10 A.M.	W6CTR-W6EFD-W6FAI — ?	[?] 12 HRS. 20 MINS.	390	2	195	[ ] 31.6	2.1
73EKYJ54 7:05 A.M.	W7CN-W7SL-W7ACJ (died 7:32 A.M. P.S.T.)	[27 MINS.] 16 HRS 25 MINS	245	2	123	[545] 14.9	.99
JAN. 25 72SYMX53 7:27 A.M.	W3UK-W1BCR-W5PP-W6CNE-W5PP-W8WM-W1BCR-W3UK (See alt. routes)	41 MINS.	4760	7	680	6970.	5690.
84TZNY65 7:45 A.M.	W4PW-W4TM-W6CJQ-W4TM-W4PW	32 MINS.	4400	4	1100	8250.	550.
15LRFQ85 10:15 A.M.	(W6KT-Started on 14 m.c.) to W8RD-continued on 3.5 m.c.-W8AWQ-W8AGU-W8AND-W1BCR-W8AKW-W5PP-W5KV-W6FAI--?--(W6WG-W6KT) (See alt. routes)	[11 HRS 12 MINS.] 12 HRS. 15 MINS.	3380	8	422	[302] 27.6	294.5
51QWKV32 7:56 A.M.	W1QK-W1BCR-W3UK-W8ARS-W8AGU-W8AWQ-W8WM-W8AOU-W8CMA-W8CMK--? (See alt. routes)	[?] 15 HRS. 34 MINS.	1015	9	112	65.3	88.2
61RXLW42 8:20 A.M.	W1AFQ-W1QK-W1BCR-W3UK-W8AGU-W8AWQ-W8WM-W9AAI-? (See alt. routes)	[2 HRS. 11 MINS.] 16 HRS. 10 MINS.	1040	7	148	[471] 64.3	52.6
11KQEP81 5:30 A.M. ?	W6BBJ---?---W6CNE-W5PP-W9FSZ--?	[13 HRS] 16 HRS	1980	3	660	123.8 [152.5]	18.5
42PVJU21 8:10 A.M.	W2QN-W3SS-W8WM-W9EXC-W9FUL---?	[50 MINS.] 16 HRS. 20 MINS.	780	4	195	[938] 46.8	12.72
95IOCN77 7:45 A.M.	W7SL-W7ACJ-W7AOO ----? (See alt. routes)	[1 HRS. 25 MINS.] 14 HRS. 45 MINS.	270	2	135	[23.6] 18.3	1.22
340UIT12 3:50 P.M.	W6CTR-W6FP-W6EFD---?	[?] 7 HRS. 40 MINS.	130	2	65	17.1	.7
21MSGR89 6:40 A.M.	W7ACJ-W7ARJ---?	15 HRS. 50 MINS.	450	1	450	28.4	.47

NUMBER & STARTING TIME	ROUTING (C.W.)	TIME	TOTAL MILES	NO. OF RELAYS	MILES PER HOP (approx)	MILES PER HOUR	$\frac{M \cdot R^2}{T}$
JAN. 11 88PSHF18 7:20 A.M.	W7BHM-W8CGS-W9AIR-W7KQ-W9AIR-W9EQV-W0FHU-W9GFL W8BTK-W8SG-W3AIS-W3GS-W1MK (died 8:37 A.M. E.S.T.) (See alt. routes)	13 HRS. 17 MINS.	5240	12	436	395.	900.
35NQFD65 7:14 A.M.	W1KH-W8CNO-W9EJQ-W6KU-W9EJQ-W9ACL-W9CNG W9FYB- (died 10:36 A.M. C.S.T.)	4 HRS 22 MINS.	4640	7	662	1065.	867.3
16QTIG46 3:02 P.M.	W1ANH-W1LM-W1IP-W2SC-W8DED-W9FAM-W7IV- W7ACQ-W9CMY- (died 10:55 P.M. C.S.T.	8 HRS. 53 MINS.	3760	8	470	424.	451.2
20ILAY50 7:24 A.M.	W3BEX-W9EJQ-W6KU-W9EJQ-W8IF-W8BSE- W8DES-W8ON-W3GS-(died 8:00 P.M. E.S.T.)	12 HRS. 36 MINS.	5045	8	630	400.	427.2
81GJYW11 7:46 A.M.	W4DW-W8CUG-W9COS-W7ALM-W9COS-W9EYH- W3BQV-W3NF-W4DW. (See alt. routes)	15 HRS. 9 MINS.	5375	8	672	355.	378.2
36KNCA93 8:40 A.M.	W3ATJ-W3UX-W8CEO-W8DLG-W8CNO-W8DYH- W8BMG-W9ANR-W9DCD-W7ACH (died 8 P.M. P.S.T. See alt. routes)	14 HRS. 20 MINS.	2970	9	330	207.5	279.36
86LODB16 1:25 P.M.	W4PM-W4JR-W3CXM-W8CEO-W8SG-W9BAZ-W9AMO-W9ACL- W9NH-W6AIX-W9NH-W9ACL-W3GS-W4DW-W4PM (See alt. routes)	10 HRS. 4 MINS.	6270	14	448	592.	203.
01BETR41 7:49 A.M.	W6BI-W6UO-W4JR-W6UO-W6AM-W6BI	10 HRS. 46 MINS.	4815	5	963	448.	186.
63FIXV93 8:04 A.M.	W4JR-W8DLG-W8CNO-W8BAS-W9EYH-W9COS- W9AIR-W9ESA-W6RJ (10:40 P.M. P.S.T.) (See alt. routes)	17 HRS. 36 MINS	2720	8	340	154.	164.8
00HKZX30 7:25 A.M.	W2COS-W2BGO-W8BZB-W8CNM-W9COS-W9AIR-W9ESA- W6RJ (10:30 P.M. P.S.T.) (See alt. routes)	18 HRS 5 MINS.	2665	7	380	147.7	119.7
610RGE91 7:55 A.M.	W1IP-W9EQV-W9ACL-W9DZK-W9CMY-W9HL-W9EVE (died 10:50 A.M. M.S.T.)	4HRS. 55 MINS. 11HRS. 35 MINS.	2130	6	355	[434] 121.2	72.6
76ZCRP17 7:57 A.M.	W6AM-W6UO-W8CGF-W8BFG-W1BLV (died 11:25 P.M. E.S.T. (See alt. routes)	12 HRS. 28 MINS.	2880	4	720	231	61.6
10MPEC40 7:40 A.M.	W3AAJ-W8CDT-W3BQV-W8BZB-W8CNM-W9CVQ- (died 2:30 P.M. E.S.T.)	[6HRS. 50 MINS.] 16HRS. 50 MINS.	870	5	174	[127.9] 51.7	21.5
20SVK161 6:50 P.M.	VE5AL-VE4IO-W9GP (died 10:30 P.M. C.S.T., power went off.)	[1HRS. 40 MINS.] 5HRS. 40 MINS.	1500	2	750	[902.] 264.5	17.6
13QTIG54 6:50 P.M.	W7ACQ-W7IV-W9BAE-W9CFU. (died 11:10 P.M. C.S.T.)	[2HRS. 20 MINS.] 5HRS. 40 MINS.	1320	2	660	[566] 233.5	15.5
46EHWU86 5:30 P.M.	W7UN-W7ACH-VE4BB----?	[1HR. 10 MINS.] 5HRS.	960	2	480	[828] 192.	12.8
30DGVT70 8:16 A.M.	W7ALM-W7GW-W9AXG (died 11:25 P.M. C.S.T.)	[13HRS. 9 MINS.] 13HRS. 14 MINS	1820	2	910	[138.5] 137	9.18
41JMBZ71 11:00 A.M.	W3GS-W8DLG-W8BGX-W8BZB (died 4:45 P.M. E.S.T.)	[3HRS. 45 MINS.] 12HRS. 30 MINS.	330	3	110	[57.2] 26.3	3.84
JAN. 18 27LODB40 8:10 A.M.	W4JR-W6AKW-W4JR (See alt. routes)	5 MINS.	4140	2	2070	49680.	3312.
37GJYW50 7:06 A.M.	W1CDX-VE3GT-W8BAS-W7ALM-W8BAS-VE3GT-W8KD W8CUG-W1SZ-W1BDI-W1CDX (See alt. routes)	4 HRS. 8 MINS.	5950	10	595	144.2	2400.
70NQFD83 7:49 A.M.	W8OK-W8CNO-W9EJQ-W9BOQ-W6KU-W9BOQ W9EJQ-W8CNO-W8OK	2 HRS. 14 MINS.	4570	8	571	2060	2162.4
31UXMK72 8:20 A.M.	W6ZBJ-W6LM-W6AM-W6UO-W9BNT-W4JR-W9BNT W9BBS-W6UO-W6AM-W6LM-W6ZBJ	13 HRS. 30 MINS.	5190	11	471	384.	775.5
53HKZX66 7:40 A.M.	W1ADW-W9AIR-W7ACH-W9AIR (died 7:30 A.M. C.S.T.)	50 MINS.	3840	3	1280	4610	691.2
23UXMK36 6:22 A.M.	W7KZ-W6AM-W6UO-W9BNT-W4JR-W9BNT-W9BBS- W6UO-W6AM-W6BI-W7KZ (See alt. routes)	16 HRS. 49 MINS.	6915	10	691	411	686.
70ILAY83 8:30 A.M.	W1HD-VE3ZZ-W8CUG-W8DYH-W9EPO-W9EYH-W9BNT W9BCA-W7AAT-W6KU-W7AAT-W9COS-(died 11:30 P.M. C.S.T.)	16 HRS.	5040	11	458	315.	635.
08EHWU21 12:06 P.M.	W3NF-W3CXM-W8AAT-W8CUG-W8DYH-W9AMI-W9GAI- W9COS-W7AAT-W6BBO-W7AAT (died 11:15 P.M. M.S.T.)	13 HRS. 9 MINS.	3885	10	388	295.5	492.
22FIXV35 7:50 A.M.	W1EZ-W8KD-VE3GT-VE3ZZ-W8CUG-W8DYH-W9EPO-W9EYH W9BNT-W7AAT-W6KU-W7AAT (died 11:24 P.M. M.S.T.) (See alt. routes	17 HRS. 34 MINS.	3735	11	339	212.6	429
53ZCRP66 6:33 A.M.	W6BI-W6UO-W9BNT-W4JR-W9BNT-W9BBS-W6UO- W6AM-W6BI	14 HRS. 53 MINS	5155	8	644	348.	369.6
38XAPN51 6:31 P.M.	W7UN-W7ALM-W7AAT-W9BCA-W1MK (died 11:30 P.M. E.S.T.) (See alt. routes)	1 HR. 59 MINS.	2680	4	670	1340	360.4
18SVK131 7:13 A.M.	W6ETJ-W6UO-W9BNT-W4JR-W9BNT-W9BBS- W6UO-W6AM-W6ETJ.	14 HRS. 39 MINS.	4935	8	616	336.	358.4
93ORGE06 7:30 A.M.	W3AAJ-W8CUG-W9COS-W7AAT-W7ALM-(W7ED-W7ZD- W7ED)-W7ALM-W7AAT-W9BCA-W1MK died (See alt. routes)	14 HRS. 51 MINS.	5110	7	475	344	280.7
20TWLJ33 7:52 A.M.	W6KU-W7AAT-W9BCA-W1MK-W9BCA-W7AAT-W6KU	12 HRS. 51 MINS.	5420	6	903	422.	252.6
45YBQO58 7:37 A.M.	W7ACQ-W7AAT-W9BCA-W1MK-W9BCA-W7AAT W6KU	14 HRS. 13 MINS.	5190	6	865	364.	218.4
17DSHF30 7:20 A.M.	W2COS-W9AKL-W7ALM-W7AAT-W9COS-W8CEO W1AHP---?	14 HRS. 32 MINS.	5200	6	866	358	214.8
48MPEC61 9:29 A.M.	W4PM-W4JR-W9ASJ--?--W8CWK-W9COS-W7AAT- W6BBO-W7AAT- (died 11:20 P.M. M.S.T.)	15 HRS. 51 MINS.	4035	7	576	255.	207.2
32WZOM45 7:25 A.M.	W7ALM-W7AAT-W1SZ-W7AAT-W7ALM	12 HRS. 37 MINS.	5080	4	1270	403	107.2
07KNCA20 7:50 A.M.	W4DW-W8DJC--?--W9FSG-W9BAS-W9EJQ-W9BOQ (died 1.19 P.M. C.S.T.)	[6HRS. 29 MINS.] 16HRS. 40 MINS.	1210	5	242	[187.2] 74.1	30.25

NUMBER & STARTING TIME	ROUTING (C.W.)	TIME	TOTAL MILES	NO. OF RELAYS	MILES PER HOP (approx.)	MILES PER HOUR	$\frac{M R^2}{T}$
JAN. 18 16QTIG46 4:17 P.M.	W1ANH-VE3GT-VE3HL----?	[1HR. 52 MINS.] 7HRS. 13 MINS.	900	2	450	[484] 124.8	8.32
88JMBZ01 9:38 A.M.	W1BXB-W2WB----?	13 HRS. 52 MINS.	200	1	200	14.45	.24
JAN. 25 44JMBZ67 7:34 A.M.	W3GS-W7AAT-W6AKW-W7AAT-W3GS	9 MINS.	5290	4	1322	35,220	9400.
94MPEC57 7:32 A.M.	W4JR-W6AM-W4JR	2 MINS.	4200	2	2100	126,000	8400.
88ADSQ31 5:03 A.M.	W6AM-W4JR-W6AM	2 MINS.	4200	2	2100	126,000	8400.
73GJYWI6 7:45 A.M.	W4OC-W4JR-W6AM-W4JR-W4OC	27 MINS	4480	4	1120	9740.	2652.
46SKVI75 6:39 P.M.	W7UN-W6AM-W4JR-W6AM-W7UN	38 MINS.	5910	4	1477	8950	2488.
89HKZX32 7:30 A.M.	W4SS-VE3GT-W8CUG-W9COS-W7ALM-W9COS-W9BCA-W9EYH-W8DYH-W8CUG-W3AJR---?---W3WO-W4JR-W4SS (See alt. routes)	11 HRS. 15 MINS.	6415	13	493	571.	1599.
48TWLJ77 6:15 A.M.	W7ALM-W9COS-W9BCA-W9EYH-W8DYH-W8CUG-VE3ZZ-W2MQ-VE3ZZ-W8CUG-W8DYH-W9CEE---?	7 HRS. 20 MINS.	3975	11	361	540	1094.5
71YBQ014 6:23 A.M.	W6BI-W6AKW-W7AAT-W9EJQ-W9FFY-W9FAW-W8AKV-W8DPI-W3AAJ-W8DPI---?---W8APG-VE3AD- (died 10:30 P.M. E.S.T.)	13 HRS. 7 MINS.	3895	11	354	294	613.8
44EHWU77 8:45 A.M.	W1ATQ-VE3GT-W8DYH-W9EYH-W9BCA-W7AAT-W6AKW-W7AAT-W9BCA-W4JR-(died 10:41 P.M. E.S.T.)	13 HRS. 56 MINS.	5550	9	616	398	538.2
58FIXV91 7:50 A.M.	W1WV-W9AIR-W7KQ-W9AIR-W9KB--?--W9AFN-W8CUG-W3NF-W1WV (See alt. routes)	11 HRS. 48 MINS.	5225	8	653	443	472
59WZOM91 5:20 A.M.	W7KZ-W7FL-W6AKW-W7AAT-W9EJQ-W9ALA-W9BCA-W9EYH-W3BO (died 6:25 P.M. E.S.T.)	10 HRS. 5 MINS.	4295	8	536	426	454.4
19CFUS52 8:10 A.M.	W6ETJ-W6UO-W6AKW-W7AAT-W4JR-W7AAT-W6AKW.	12 HRS. 6 MINS.	5635	6	939	467	279.
98BETR41 6:57 A.M.	W6KU-W7AAT-W9EJQ-W9ALA-W9BCA-W9EYH W3BO (died 6:40 P.M. E.S.T.)	8 HRS. 43 MINS.	2805	6	467	321	192.6
83LODB36 7:30 A.M.?	W3BEX---?---W8CLQ-W8BMG-W9BAS-W9FUW W9CMY-W9HL- (died 9:56 A.M. M.S.T.)	[5HRS. 26 MINS.] 18 HRS.	1580	6	263	[290] 88	52.8
31DGVT64 6:14 A.M.	W6BYH-W7AAT-W9EJQ-W9FAW-W9ARE---?	[6HRS. 15 MINS.] 13HRS. 16 MINS.	1940	4	485	[311] 127.	33.6
59ORGE12 8:20 A.M.	W2COS-W8BGX-W8DYH-W9EYH-W9BCA-W9COS- (died 8:53 A.M. C.S.T.)	[1HR. 33 MINS.] 16HRS. 10 MINS.	1265	5	253	[827] 78.4	32.5
26ILAY49 9:30 P.M.	W2BIV-W8VP-W9AMI (died 9:50 P.M. C.S.T.)	[1HR. 20 MINS.] 3 HRS.	680	2	340	[510] 226.6	15
36NQFD79 9:22 A.M.	W4PM-W4JR-W8CHC----?	[5HRS. 25 MINS.] 14HRS. 8 MINS.	550	2	275	[101.8] 38.9	2.58

WITH THE C.W. MEN ON JANUARY 11TH

Twenty-three messages were filed with stations on the c.w. side on the first Sunday. Of these, eighteen were actually started. Things were found to be quite disorganized in the c.w. ranks for the first relay. Practically no transcon routes were in operation and all operators seemed to be relying on chance to get the messages through; not that they didn't work hard, for they did and plenty of stations were on the air looking for msgs but they apparently had not made the same preparation in lining up stations that the 'phone men had previous to the starting time. Nevertheless, three of the eighteen transcons started spanned the continent and replies were received at the starting stations (W4DW, W4PM and W6BI). W6AM kept an hourly schedule all day with W6UO at Yerington, Nevada, in order to clear and receive any transcons which might be coming through. He also worked a schedule



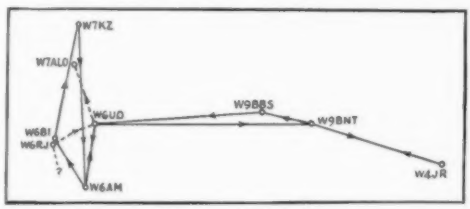
hourly throughout most of the day with W6AK near Sacramento, California. W6UO reports, "I regret that I did not start taking messages

from the west coast earlier in the morning but I hesitated to offer my services as I thought the boys could make a longer jump. I did take some about 8:00 a.m. I stayed on the job all day, and though I called 'east' at frequent intervals failed to raise or hear anything east of me until between 4:00 and 5:00 p.m." W4DW enjoyed the day very much. He says, "If everyone enjoyed that relay as much as I did, there was certainly a joyous bunch of hams in the United States." W8CNO, the well-known "XYL," was on the job but as Sunday is a big day in the kitchen she was handicapped by her "cookery" tasks. W7GW did all he could to help out. He reports, "Was on the air all day. Made thirty directional

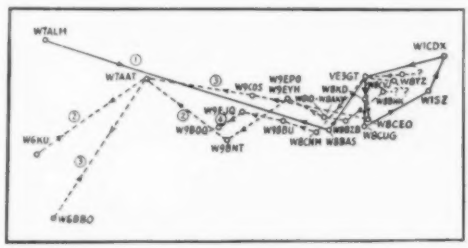
calls and contacted fourteen stations. Listened for '9s,' but first one was not heard until 4:20 p.m. P.S.T. I had other stations standing by for calls for me but n.d." W6BMW states, "There were not enough stations on the air to handle the west coast end of the transcons." VE5AL did not start his message in the morning, as he spent that part of the day in bed doctoring a cold. However, he went on the air in the evening and raised VE410 at Calgary, Alberta, at 6:10 p.m. P.S.T. and cleared his message. Later in the evening VE410 passed the message along to W9GP. Just as W9GP got ready to QSP, his power went off and he was without juice until after the close of the relay. W4JR reports, "Conditions very bad locally due to induction QRM which continued all day until after 6:00 p.m." According to W7KO eastern signals were very f.b. until about 5:30 a.m. P.S.T. when they started to fade. The 9th district was still coming through f.b. after 6:00 a.m. Previous to the transcons W7ALM had done no operating on the 3500-kc. band so he had to get busy and build up coils for both his receiver and transmitter and generally revamp the station for 3500-kc. operation. It is well that he did take this initiative as he handled many of the messages during the relays. W1IP: "Was up bright and early and got my message out as soon after sunrise as possible. Did not hear anything from the other messages from the west coast all day long, in fact I didn't hear any station CQing east from sunrise until I hit the hay at 11:45 p.m."

WITH THE C.W. MEN ON JANUARY 18TH

Things went considerably better with the c.w. side on the second Sunday. The fellows realized that the 'phones had outdone them in the first combat and they went at it with added vigor. The messages traveled along better-organized routes this time. West coast stations were permitted to start their messages one hour before sunrise, as was the case on the 'phone side. Twenty-six transcons were filed and twenty-one of that number left the starting stations. *Nine* of these made complete circuits, the originals reaching the opposite coast and replies being received at the starting points. Most of them did not make exceptional time, although two of them did very well. W4JR shot his direct to W6AKW and received an answer back in *five minutes*. W8OK's went over and back in two hours, fourteen minutes via the "Dawn Patrol" route consisting of W8CNO-W9EJQ-W9BOQ-W6KU. W7AAT served as one of the principal "relay points" for many of the transcons of the second Sunday. He says, "Was on the air a total of ten hours and transmitting most of the time. I surely did enjoy the game. I would like to extend thanks and appreciation to these stations who so heartily coöperated with me during the second transcon: W1SZ, W6AKW, W6KU, W9COS, W9BCA, W6BBO, W9BNT, W1MK, W7KO and W7ALM." W6KU explains W7AAT's important part in the relay as follows: "W7AAT



surely deserves a lot of thanks from the c.w. men for his good work. He was the 'missing link' between the east and west for us as conditions

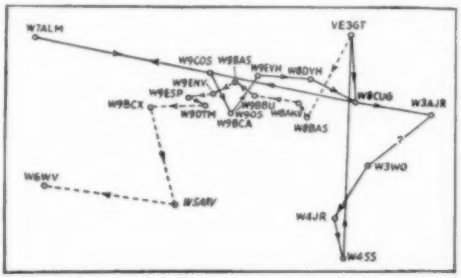


were unusually bad, making it nearly impossible to work east until late evening. These transcons should prove a real stimulant for the more effi-

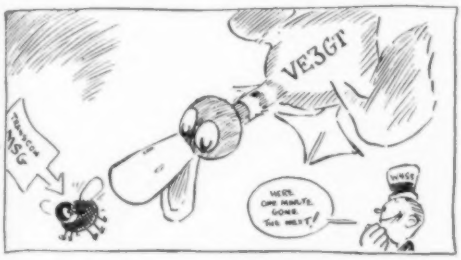
cient handling of coast to coast traffic." From W9COS — "A great picnic — thanks." W1CDX not only got his message over and a reply back, but also started *a reply to the reply message*, which reached the originating station before the closing hour. That was quite a stunt! W6AM again kept a regular schedule with W6UO all day. A total of fourteen messages went through W6AM. W9BNT and W9BCA, being at strategic points, handled a bunch going both ways. W9EPO, probably voicing the feelings of any one who got hold of a transcon says, "It was a lot of fun, but I got kind of shaky after calling about sixteen CQs and not raising any one west of me. I was afraid the messages were going to die at my station." W3NF maintained an hourly schedule with W3CXM to receive the reply to his message, but it didn't get back. W2COS enjoyed himself but writes, "I have one kick to make and others will probably make the same 'holler.' That is the fact that we have to get up so darned early to start the messages. I think if they were started at 12:00 noon it would be a lot better. Hi." W9AIR did his best to pierce the QRM with his type '10 with 5 watts input from 250 volts of "B" batteries. None of the messages started on any Sunday got much farther west than W7ALM at Astoria, Oregon — look at a map and you will understand this. W4JR handled twelve of the messages during the second relay. He reports, "Conditions were ideal all day. Established QSO with the west coast as soon as came on the air. Got in on a four-way QSO between W3CXM, W4JR, W6AKW and W1SZ. W1SZ routed a message which traveled W3CXM-W6AKW. Answer couldn't be received as daylight killed signals from the east coast. Passed W4PM's transcon to W9ASJ at 9:35 a.m. Nothing doing during all rest of daylight. At 8:09 p.m. took answer from W8CEO to the message W3CXM gave W6AKW in morning. Then had a merry time getting W9BNT in touch with W6UO. W6UO kept calling W9BNT, and W9BNT kept calling W7AAT. Finally after much frantic calling hooked W9BNT and put him on to W6UO. When they finished I took them from W9BNT and gave him the answers right back." W9BNT sends the very interesting word — "With the help of some very good A.R.R.L. stations I have been able to make my transcons total twenty-two, counting each message on receiving and sending. Stations helping me do this were W9BCA, W6UO, W7AAT, W9BBS, W9EYH and W4JR." Imagine hearing a reply to your message on the way back to you and being unable to hook up with the station having it. Such was the case with several of the operators. W7KZ watched his travel around for two hours before getting hold of it. What a feeling! A word from W9AIR: "The transcon relays were well participated in around these parts, but too much loose-jointed operation with no schedules to carry the messages after sun-up cut the effective range of individual stations. Some fellows seemed to be uninformed about the rules and accepted traffic without realizing that speed was necessary. The hardest thing was to get west coast messages for QSP east." W6AKW wants to say, "I got as much pleasure in the few minutes I was working on the transcons as I have gotten in many months."

WITH THE C.W. MEN ON JANUARY 25TH

The general feeling shown in the reports on the third Sunday's activities is that things did not go as well as on the previous Sunday. That doesn't check, however, as the c.w. men made a considerably higher score than on the other days. Twenty-three messages were filed, only seventeen of which started. Seven made complete circuits arriving back at the starting stations (W3GS, W4JR, W6AM, W4OC, W7UN, W4SS, W1WV). West coast starting stations were allowed to start their messages two hours before sunrise. W4JR and W6AM were QSO promptly at sunrise E.S.T. W4JR shot his message to W6AM at 7:32 and received a reply at 7:34 — a total elapsed time of *two minutes!* That's *real speed*, and a record for the transcons! Likewise, W6AM sent his to W4JR and received a reply in *two minutes!* W3GS' made four hops getting over and back in *nine minutes!* W4OC's took only *twenty-seven minutes* to complete the circuit. The transcons over, W2COS writes: "I think this contest had the best spirit of competition in it of any contest we have ever had. It certainly was interesting to hear the 'phone organize and hurry their messages through, and to hear the c.w. gang trying to pass the messages as fast as they could." W7KZ says, "I hope the 'phone men and the rest of c.w. men feel the way I do — I want more of these tests. They show how dependable our stations can be." A bit of a summary with much good information comes from W9AIR: "Coöperation from the western gang was all one could desire. A 'CQ West' invariably brought an answer — *from the west.* Were it not for the numerical deficiency in stations out in the sparsely settled plateau region, the daylight handicap would not have made such a difference. If the gang read *QST* with a bit more attention,



there would have been better work, also. The fact remains, barring some isolated brilliant work, that better relaying is pulled off almost any day than the general run of work during the relays (my personal opinion, of course)." Promptly upon getting on the air about 7:00



a.m., W4SS raised VE3GT, who promised a speedy QSP west on W4SS' message. W4SS says, "He lit on the message like a duck on a June bug." W4JR was again one of the principal east coast "c.w. posts," handling thirteen transcons, traveling both east and west. W7AAT handled a bunch but reports, "Every one seemed to be in a daze, and was wondering where the transcon messages were. Conditions were punk here, too." W6AM handled ten transcons, much work being carried out direct with W4JR. W7KO had a lot of fun handling the few he got hold of. He writes: "On Sunday morning signals were very good and I copied several messages direct from the east coast, but wasn't able to raise the stations. West coast stations were at a great disadvantage in sending theirs on account of the time. One thing I noticed was that the better class of stations and operators were on and naturally got the big share. W4JR was especially f.b. here." W4PM blew a filter condenser a few hours after starting his message and was obliged to operate on an eight watt power supply —but he still had a number of fine QSO's. W7ALM summarizes conditions for the day: "Although I was on the air longer than on the two preceding Sundays and sent out many CQ's, I worked fewer stations. Weather here was southwest storm with hard rain and hail. There were many stations on the air both morning and evening. Heard only about two 'CQ Transcon' calls. Most stations were testing, chewing the rag, or CQing (mostly CQing-hi). Didn't hear any messages coming west in the evening. Couldn't locate any one who had transcon traffic. Heard only one message coming west in the a.m. — No. 58FIXV91 from W9AIR to W7KO." W6KU had bad luck due to very poor conditions. He contacted three eastern stations after the starting time, but was unable to QSP to any of them. QRM was the worst difficulty. He finally routed his transcon via W7AAT. W8CUG reports: "Could only get hold of five again to-day, and no wonder. The QRM was terrific all day except for a slight lull around noon. I guess everyone had a good time. I know I did." W1WV got his transcon off to W9AIR, Sleepy Eye, Minn., at 7:50 a.m. E.S.T. He writes: "W1WV was on the air constantly and called 'CQ Transcon QTC?' on the hour during the day. Numerous false alarms were sounded by stations answering whose operators apparently had not read *QST* and had never heard of 'Transcon.' Finally at 7:31 p.m. W3NF answered my CQ with the information that he had the answer to my message. Final OK on receipt of the reply from W7KO, Seattle, was made at 7:38. W3NF stated he received this from W8CUG at 7:23 p.m. Quick work in the final stages. Altogether the transcon party was most enjoyable and interesting."

SPECIAL TRANSCONS

A 'phone message No. 41WLNW14 (not one of the official messages filed by HQ's) was reported to have been received at W7ACJ from W7ATV on the first Sunday.

At the special request of Operator Parmenter of W1MK, and C. C. Rodimon, W1SZ, Special CW Transcons were filed at W1MK and W1SZ for relay on the second Sunday. W1SZ's was No. 42QTIG55 and traveled W1SZ-W7AAT-W6AKW-W7AAT-W1SZ. The total time elapsed in completing this circuit was 11 minutes! The total mileage covered was 5480. W6AKW intercepted the message while W1SZ was sending to W7AAT. W1MK's Special Message was No. 42RUJH75 and went over two different routes. The first of these was W1MK-W1SZ-W7AAT-W7KO-W7AAT-W1SZ. This route represents 4950 miles. The alternate route was W1MK-W1SZ-W3CXM-W6AKW-W7AAT-W9COS-W8CEO-W4JR. W6AKW addressed his reply to "Any East Coast Amateur." The total mileage covered on this route was 5320.

In addition to the various transcons started on the East and West coasts of the United States K6DJU at Honolulu, Hawaii, was given a c.w. message to start in the Relay. This special message bore the number 65YBQO06 and was started at 4:17 a.m. H.S.T., January 25th. It traveled the following route: K6DJU-W7ALM-W9AIR. W9AIR was unable to relay. This message traveled 3900 miles.

These messages classed as "specials" do not count in the tabulated results of the 'phone-vs.-c.w. contest, but were merely generated to add to the fun of all concerned.

ALTERNATE ROUTES

In addition to the main routes shown in the tables a number of the messages traveled on various side or alternate routes. The majority of these side routes did not get the message anywhere in particular. In some cases the alternate routes were started by stations intercepting

transcons as they were being transmitted to other stations. This procedure, while not seriously affecting any routes, caused a bit of confusion in a few cases. In other cases it helped to speed the messages along their way; this was particularly true in the case of some 'phone messages. The alternate routes, complete to as great a degree as is possible to get them from the information available, are described herewith to credit the stations that got in on some of the side-trips, and to show in the most complete manner possible just what happened to every message. A study of the main route coupled with the side routes explained here gives a very comprehensive picture of the journey of each transcon that started.

'PHONE

We will start with the first Sunday, January 11th, and look over the transcons starting on the 'phone side. The first one we find with a side route is No. 29TZEY17 starting at W3WI. Both W6ANT and W6BBJ copied this while W9ESL was sending it to W6CNE. W7ATV intercepted the reply message while W6CNE was giving it to W9ESL and then sent it on to W7AOO.

No. 11XDIC91: This one was shot direct to the west coast by W1BCR. He was certainly putting out a "mean" signal that morning. W6ANT at North Hollywood, California, copied the message as W1BCR was sending it to W6CNE.

No. 57INAY98 hopped around quite a bit. As shown on the main route W9FEG was the relay point between W9FRQ and W9ESL, helping out when daylight prevented satisfactory direct QSO between FRQ and ESL. W9ESL gave the message to W9DZM, but was putting out such a nice signal that several others also copied it and sent it along. These included W9BNX, W4TM and W2FR. W9BNX got most of the transcon through to W1BCR, who missed two or three words and asked W9BNX to route it through W9AID, BNX then contacted AID and gave him the complete message. W9AID promptly made tracks to W1BCR. W1BCR gave W9AID a reply message. W9BNX checked W4TM's copy, and W4TM is believed to have sent it along to W8DS(F). W8AKW copied from W9BNX as well as from W9DZM. W2FR gave W9ESL a reply to relay to W7ANT.

No. 22DIVT63: W2AIH tried to give this one to W9PV, Emporia, Kansas, at 8:10 a.m. E.S.T., but his efforts were defeated by the rising sun. Had this first big hop out into Kansas been successful the results of this transcon would have undoubtedly been quite a bit different!

No. 17NQFD58: W6CRK started his message through two stations, W6BBJ and W6KT. The route via W6BBJ is shown in the table. W6KT used 14 mc. in forwarding the transcon. The 14-mc. route cannot, of course, count in the Relay, but the route on that frequency band may be of interest to 14-mc. 'phone enthusiasts. The course taken was W6KT-W9BKO-W8DLD-W4AGR-W8DLD-W9BKO. W6KT was given No. 90LODB31 to start, but used 14 mc., pushing it over to W8NB.

On the second Sunday, January 18th, practically all of the 'phone messages followed single routes. W4PW's No. 64CINH45 was intercepted at W6ANT while W4TM was giving it to W6CNE. W2HY's No. 61BHMG41 hopped from W9BHM to W6UZ on 14 mc.

W3UK's message of the third Sunday, January 25th, bearing No. 72SYMX53, was picked up by W7ANT from W1BCR while he was sending it to W5PP. W6CNE took W7ANT'S reply message, but did not QSP, evidently because a reply had already been speeded on its way from W6CNE via W5PP.

No. 15LRFQ85: This transcon was filed with W6KT, who again made the first jump on 14 mc., this time to W8RD. W8RD shifted to 3.5 mc. and the message proceeded along its way as shown in the table. What happened to it after it got back to W6FAI is not known. It is believed that W6KT received the answer from W6WG, but as this hop seems to have been on 14 mc. no credit can be given. Credit is given only on the mileage covered on 3.5 mc. W1BCR, the east coast station receiving this transcon, routed his reply through W8AMD as well as through W8AKW. What W8AMD did with it is not known.

No. 51QWKV32 originating at W1QK took two routes from W8WM. W8WM sent it to W8AOU and a little later to W9AAI. No information available on further routing from W9AAI.

No. 61RXLW42: W3UK sent this one to W8ARS and W3SS as well as to W8AGU, who relayed along the main route as shown in the table.

No. 95IOCN77 took the route shown, via W7ACJ, and another via W6CJQ. W6CJQ did not relay further.

These are the only side-routes known on 'phone messages. It must be understood that many stations not actually taking part in the relays were standing by to help, if needed. On January 11th W7ACJ copied W4PW's message from W4TM in order to check W6CNE, if necessary. He also copied the messages started by W6CRK, W6BIU, W6BBJ and W6GM in order to assist if the other stations missed out. Likewise W7SL coöperated with W7ATV in handling some of the messages. Probably other stations had parts in the transcon but failed to report.

C.W.

An inspection of the c.w. transcons shows as was in the case of the 'phone messages that a good bunch of stations were on the job and

(Continued on page 84)

Moving Into the 1750-Kc. Band

Some Suggestions for "160-Meter" Operation

By James J. Lamb, Technical Editor

TO those old-timers who cut their eye-teeth on 200 meters, back in the days when that wavelength was considered a short one and when anything shorter was a region of mystery still to be explored, the very idea that anyone should need information on the equipment changes necessary to adapt a station to 1750-kc. operation must seem far fetched and perhaps even ridiculous. But there are thousands of amateurs to-day to whom the band of frequencies lying between 1715 and 2000 kc. is just as unfamiliar ground as the whole region below 200 meters was to the amateurs of seven years or so ago. It is for these successors to the old "200-meter gang" that the information contained in this story is intended.

WHY "160 METERS?"

Right now there is increasing interest in the 1750-kc. band and also a surprising amount of actual use being made of this long deserted piece of amateur territory. Amateur 'phones are finding it particularly attractive, and with good reason. The whole band from 1750 to 2000 kc. is open to amateur telephony, of course, and actually offers not only almost six times as many kilocycles as the 50-kc. slice of the 3500-kc. band, but theoretically provides nearly 12 times as many communication channels. Almost any 'phone operator who uses this band will insist that it is just as good as the 3500-kc. band, as far as DX and the like are concerned, and that it offers freedom from QRM and fading that are, as a general rule, sadly lacking on the higher frequencies. Add to this the possibility of "160-meter" occupancy as a means of relieving the congestion on the crowded 3500-kc. band — and you have an excellent case for real amateur 'phone activity between 1715 and 2000 kc.

C.w. operation in this band has its attraction too, particularly for that short-haul traffic that does not require the use of the farther-carrying higher frequencies and which is often handicapped by the bad fading or even complete "wipe-out" experienced at times on the 3500-kc. band. Looking into the future a bit and speculating on the hypothesis advanced in K.B.W.'s recent editorial (February *QST*), there is considerable possibility that the 1750-kc. band may become necessary rather than just convenient for the short-haul work, with what cosmic drift and eleven-year cycles shifting the utility ranges of the various amateur frequencies.

Undoubtably there are some few amateurs who may object that they are so situated as to make it seem difficult or even impossible for them to adapt their stations for operation on frequencies as low as 2000 kc. There are locations, for

instance, where it may seem impossible to erect a decent antenna system for operation on this band. Then again the problem of interference to BCL's is likely to appear more serious than on the higher frequencies. This factor is really likely to handicap 1750-kc. work in some instances, perhaps to the extent of making necessary the observance of "quiet hours," but should not be serious if transmitters of the right sort are concerned. It also may be true that QRN is more effective in putting 1750-kc. communication in a hole, when and where QRN becomes bad, but this handicap is largely seasonal and is alleviated by the fortunate circumstance that the heavy operating seasons — spring, winter, and fall — are the light QRN seasons.

All in all, there are more than sufficient selling points for the old 1750-kc. band to make it look like a pretty valuable amateur possession right now; it certainly has enough attractive features to encourage a fairly general moving-in on the part of those who can possibly do so.

HOW ABOUT THE ANTENNA?

Of course the ideal antenna system — general present-day amateur practice considered — would seem to be a fundamental Hertz radiator fed by one of the several systems now in vogue. In fact the recent trend in amateur antenna design might lead one to believe that anything less would be hardly worth considering. Now a full-size 1750-kc. half-wave Hertz radiator is in itself an affair of no mean proportions. Its length will be something between 231 feet (for 2000 kc.) and

275 feet (for 1715 kc.), the exact length being computed by the following formula:

$$\text{Antenna length in feet} = \frac{472{,}320}{\text{Frequency in kc.}}$$ [1]

It is obvious that there will not be many amateurs with sufficient backyard room to allow the erection of a Zepp, doublet, or other type of conventional straight-line Hertz antenna of such length, and those who do have sufficient room are fortunate indeed. Fig. 1 shows a few suggestions for 1750-kc. systems. But use of the 1750-kc. band need not be restricted to the fortunate few, because surprisingly good results can be obtained with 3500-kc. and even 7000-kc. band antennas suitably modified to make them work in the 1750-kc. band. They may not operate with the complete efficiency of a full-size 1750-kc. antenna system, but their inferiority will not be as great as one might expect.

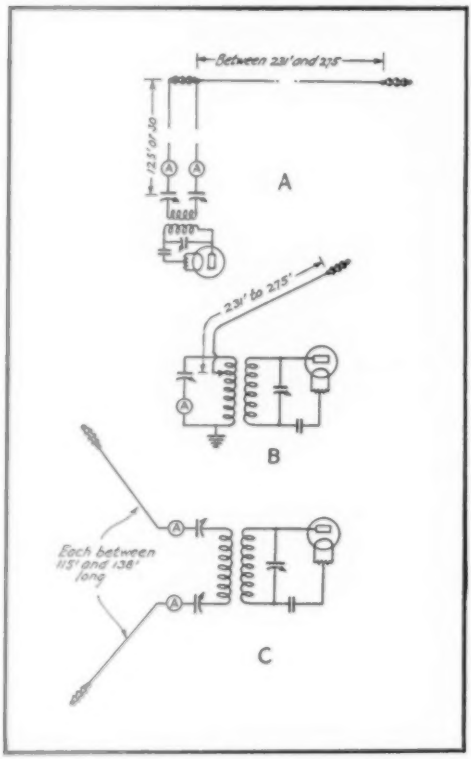


FIG. 1. — TYPICAL FUNDAMENTAL 1750-KC. ANTENNA SYSTEMS

If you have plenty of space, the Zepp of **A** *would be truly imposing. The voltage-feed Hertz of* **B** *is simpler and requires less space. The current-feed system suggested in* **C** *could be erected with more ease and could be arranged with the two sections the same height above ground or one above the other. They should be kept as far apart as possible and preferably run in opposite directions.*

[1] This formula is based on that for the length of the radiator of the doublet antenna for frequencies below 3000 kc. as given on page 24, *QST*, Dec., 1930, and on page 166 of the latest Handbook. In terms of wavelength, the length in feet would be 1.57 x the natural wavelength in meters. Do not become excited because this is not in agreement with 1.56 and several other constants for computing antenna length. Remember that each is based on the average for a group of measurements; and that a difference in length of one per cent or so will not affect seriously the tuning of a linear oscillator with as much effective resistance as a Hertz antenna. If you prefer, the factor 1.56 may be used. But it won't be necessary to write to the Information Service asking which one is exactly right.

MODIFIED 3500-KC. SYSTEMS

It is quite probable that the group most likely to find the 1750-kc. band alluring will be those amateurs now occupying the 3500-kc. band, particularly the 50-kc. 'phone slice of it. Two representative systems are shown in Fig. 2. That shown in *A* would be used with the antenna tuning condenser shunting the antenna coil for 3500-kc. operation (and for the higher frequency bands as well), but when used for 1750-kc. work the shunt condenser would be disconnected or set at zero capacity and the whole system tuned by the single series condenser. The total length of the wire, radiator and feeders included, will be approximately one-half wave length and each half of the "radiator" will be only one-eighth wave in length. This will not reduce the effective-

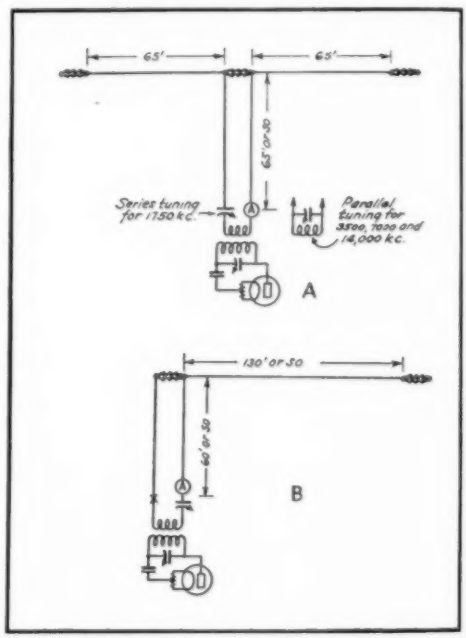


FIG. 2. — TYPICAL 3500-KC. SYSTEMS MODIFIED FOR 1750-KC. OPERATION

That shown in **A** *(half-wave current-feed for 3500 kc.) would be half-wave with all but the two end ⅛-waves folded. The Zepp shown at* **B** *would become a half-wave with an end quarter-wave folded back on itself. More complete details are given in the text.*

ness of the system to one-half that of a "regular" half-wave radiator, by any means, and good results should not be surprising.

A typical 3500-kc. Zepp system with suggested modifications for 1750-kc. operation is shown at *B*. In contrast to the arrangement shown at *A*, where we have current feed at the center of a half-wave antenna partly folded back on itself, here we have a half-wave system with the coupling inductance approximately ⅜ wave from the far end. Coupling at this point is not likely to be so effective as coupling at the exact center, of course, but it will work. If the system happens to be one in which the feeders are less than 60 feet long (and which uses parallel tuning for 3500-kc. operation) it may be necessary to connect a loading inductance in series with the "dead" feeder. The size of this inductance will depend on the length of the feeder, but usually 25 to 50 turns of ordinary antenna wire on a 3-inch diameter form, with string wound between the turns, will do the trick. This system will not provide complete cancellation of radiation from the feeders, because the current distribution is not symmetrical, but this will assist rather than hinder the operation of the entire system since the horizontal section is but a quarter-wave long at 1750 kc.

The single- and two-wire matched-impedance 3500-kc. systems are not so easily modified for 1750-kc. operation. Two workable schemes are shown in Fig. 3. Both of these utilize the antenna and feeder systems together as a sort of "T" operated against a counterpoise or good ground. As an alternative to the counterpoise or ground, a single wire of sufficient length might be used to bring the fundamental of the whole works to something like 1750 kc. In figuring the total length necessary to resonate at 1750 kc. the length from the furthest end of the "flat-top" to the extreme end of the single wire in the lower section should be computed, the formula previously given being applicable. This additional single wire is *not* a counterpoise, because a counterpoise must have considerable capacity to ground and is really a part of the resonant antenna system. A genuine counterpoise consists (as any old timer will inform you) of a network of wires strung over the back yard and joined together at one point which is connected to the inside tuning equipment as shown at *B* in Fig. 3. And a quarter-wave antenna worked in conjunction with a good ground is not to be scoffed at, either. In fact practically all the broadcast stations use this type of radiating system — the big 50-kw. outfits included — and it is very effective. A good ground cannot always be obtained by simply making a connection to the nearest waterpipe, although such an easily obtained ground system sometimes will prove satisfactory. The best ground system consists of a number of rods driven six feet or more into moist earth; or, better yet, a half-dozen or so wires buried in shallow trenches radiating from a common point where the ground connection is made. The latter system is generally used by the broadcast stations. Since a genuine counterpoise or good ground is a non-resonant affair, the wires need not be of any particular length.

It is impossible to give exact dimensions for antenna systems to suit every individual requirement, but a study of the local situation and the exercise of a little common sense should bring forth an arrangement that will make the best use of an existing system and fit almost any station for satisfactory 1750-kc. operation. It will be found that many systems can make good use of parallel tuning of the antenna inductance, particularly where the feeder system is shy on length, and it is suggested that parallel tuning be tried in case it may be possible to hit resonance with the antenna tuning condenser in series.

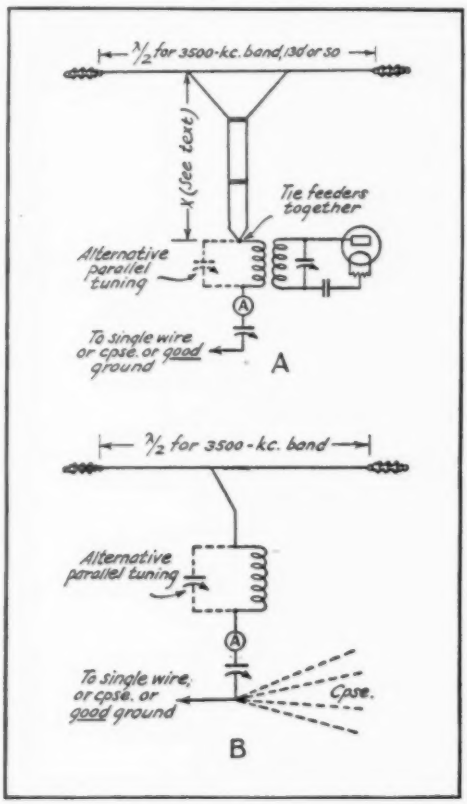


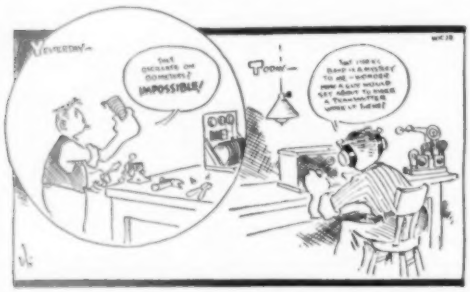
FIG. 3. — MODIFIED MATCHED-IMPEDANCE FEED SYSTEMS

They become T affairs requiring more length (a single wire from the lower end of the antenna coil), or either a counterpoise or ground, to give them a 1750-kc. fundamental frequency. B is likely to resonate to either one of two frequencies.

Incidentally, the idea of end-loading Hertz antennas, as described in the Experimenters' Section, March, *QST*, offers promise. Experiment with this idea for 1750-kc. systems is suggested.

ANTENNA INDUCTANCES

To obtain good coupling between the transmitter tank circuit and the antenna circuit, the antenna inductance for 1750-kc. work will be proportionately larger than the usual 3500-kc. antenna



coil. The exact size will depend on the amount of loading required by the antenna, to some degree, although a 10- to 25-turn inductance between 4 and 6 inches in diameter will usually do the job. The construction of the antenna coil will be quite similar to that of the plate tank inductance and will be described a little later.

It is advisable to use a tuning condenser — either series or parallel — having a maximum capacity of 500 $\mu\mu$fd. or more so as to give a tuning range compatible with the frequency. Incidentally, this is a good opportunity to make use of those old .001-μfd. condensers that have been lying around. But there will be more about tuning condensers when we get to the transmitter itself.

TRANSMITTERS, ESPECIALLY 'PHONE

Practically every type of transmitter that is good for its purpose on the higher-frequency bands will perform just as well and perhaps better on the 1750-kc. band. This applies to both self-excited c.w. and oscillator-amplifier c.w. and 'phone outfits. Hartley, Colpitts, Armstrong (Tuned-grid Tuned-plate), TNT — all these oscillators operate admirably; and good frequency stability can be obtained even more easily than on the higher frequencies.

The necessity for a high degree of carrier frequency stability is just as great as on the lower frequencies, particularly in the case of a 'phone transmitter. It is commonly known that modulation of an oscillator, for instance, can result in a broad wave that will cause interference not only on frequencies near the nominal carrier frequency but also on frequencies hundreds of kilocycles off the transmitter's carrier frequency. The production of these spurious interfering frequencies is a complex business involving wabbling of carrier frequency simultaneously with the generation of side-bands for a multitude of carrier frequencies. Analysis of what actually happens is difficult, if not impossible, but experimental proof of the horrible results is constantly with us, for it is the interference caused by transmitters afflicted with just such a combination of frequency and amplitude modulation that brings forth most of the BCL complaints. Since the 1750-kc. band is but a few hundred kilocycles from the broadcast band, 'phone transmitters of the modulated oscillator type are practically "out" and nothing less than an oscillator-amplifier rig, with modulation taking place in an amplifier stage well isolated from the oscillator, can be expected to prove satisfactory. Either self-control or crystal-control for the oscillator will be suitable provided good frequency stability is maintained. A set designed on the plan of any one of the 3500-kc. 'phone sets described in recent issues of *QST* and in the Handbook (Seventh Edition), with the tuned circuits modified for 1750 kc., will be entirely suitable.

Crystal control becomes increasingly more economical and hence attractive as the frequency goes down below 2000 kc., because of the improvement in over-all transmitter efficiency — frequency doublers are unnecessary — and the lesser cost of 1750-kc. crystals. Then, too, a crystal-controlled transmitter is much easier to handle on this band than on the higher frequencies.

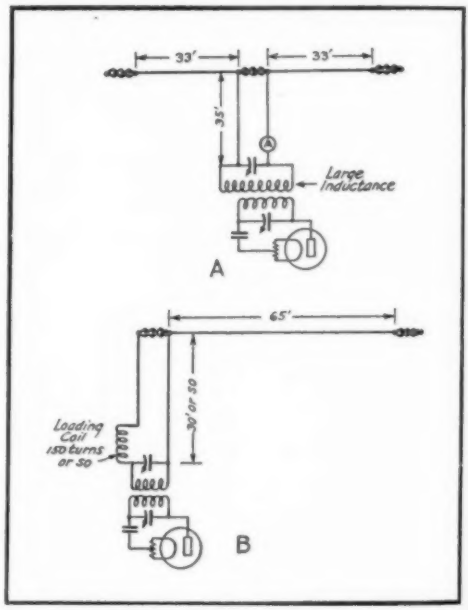


FIG. 4. — REVAMPING TYPICAL 7000-KC. ANTENNAS

Parallel tuning and loading will be necessary in most cases.

An excellent example of good 1750-kc. crystal-controlled oscillator-amplifier transmitter design is W9DAX's outfit described in January *QST*. Although this is primarily a 'phone transmitter it also would make an excellent c.w. set. If it were to be used for c.w. exclusively the second Type '10 stage (the modulated stage) could be eliminated. This station description, by the way, contains a lot of valuable information for the fellow who is looking for practical hints on 1750-kc. transmitter design.

INDUCTANCES

The major modification necessary in most transmitters will be simply a change in the inductances. Let's use a typical set designed for 3500-kc. operation as an example — say the single-control transmitter described in *QST*, December 1929, and in the Seventh Edition of the Radio Amateur's Handbook. The 3500-kc. plate coil for this transmitter consists of 12 turns of ¼-inch copper tubing, the outside diameter of the coil being nearly 3 inches. Using the same tuning condenser, approximately four times as much inductance will be required for the 1750-kc. band as for the 3500-kc. band (inductance varying inversely as the square of the frequency). This increased inductance can be obtained either by *doubling the diameter and keeping the number of turns and spacing between turns the same*, or by *increasing the diameter 41% and doubling the number of turns*, also keeping the spacing between turns the same.[2] Therefore, our new coil can be of 12 turns and 6-inch diameter or 24 turns and 4.25-inch diameter, the spacing between turns being ⅛ inch in both cases. If it should seem desirable to use a coil of smaller dimensions than would result in either of the foregoing cases, the approximately correct inductance can be obtained by using a smaller conductor (such as No. 12 or No. 14 solid copper wire) and winding twice as many turns on the same diameter form, with spacing between the turns such that the total length of the coil as measured along the form is the same as that of the 3500-kc. copper tubing inductance.

The use of the smaller conductor will not cause undue heating, because the *C-L* ratio will be about one-fourth that of the 3500-kc. tank and the tank current will be accordingly less. Nor will the lower *C-L* ratio practically affect the frequency stability, although a higher *C-L* ratio would do no harm. In fact, a High-*C* tank may be a distinct advantage at 1750 kc. in that it will lower the radio-frequency voltage across the tank condenser and reduce the possibility of condenser break-down, especially with the modulated r.f. encountered in the amplifier stage of a 'phone set.

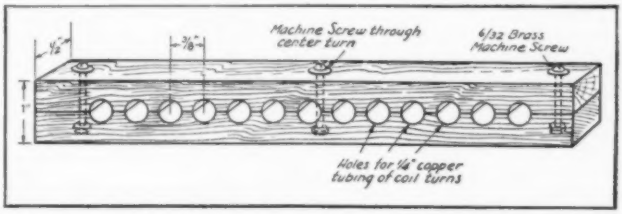


FIG. 5. — LARGE COPPER TUBING INDUCTANCES REQUIRE STIFFENING

Bracing strips like the above are easily made. The holes are bored first and the piece sawed in two afterward. The two strips should be clamped both at the ends and the center to prevent bowing, the center machine screw going through the center turn of the inductance.

A .001-μfd. tuning condenser will fit in nicely and will make necessary but twice as much tank inductance as compared to four times as much required with the 500-μμfd. condenser in the above combinations. Again using the 12-turn 3500-kc. inductance intended for use with a 500-μμfd. condenser as a standard of comparison, the 1750-kc. inductance for use with a .001-μfd. tuning condenser should have the same number of turns and spacing, with a 41% increase in diameter: for instance, a ¼-inch copper-tubing inductance of 12 turns with a diameter of 4.25 inches and ⅛-inch spacing between turns.

These suggestions are generally applicable to the tank circuits of other types of oscillators and also to the tanks of amplifier stages. From the efficiency angle, a Low-*C* tank using a 500-μμfd. condenser will be better for the amplifier stages providing the condenser has sufficient spacing to withstand the r.f. voltage across it. This in turn will depend on the type of tube used and the plate voltage as well as the load on the tank circuit. Further ideas on the design of oscillator-amplifier sets will be found in George Grammer's article in February *QST*.

COIL CONSTRUCTION

When ¼-inch copper tubing is used for the tank coils they are likely to be quite sloppy affairs unless some provision is made for giving them support additional to that provided by the tubing

[2] The general formula for tuned circuits is given on page 41, The Radio Amateur's Handbook, Seventh Edition, and the formula for inductance calculation is given on page 207 of the same book. In general, the inductance of a coil varies nearly as the square of the diameter (increasing the diameter 41% doubles the inductance), and directly as the number of turns, provided the wire diameter and spacing between turns remain constant. If the length of the coil is kept constant by reducing the wire diameter and spacing, however, the inductance varies as the square of the number of turns. For a given value of capacity, the frequency varies inversely as the square root of the inductance: to halve the frequency, the inductance must be quadrupled (as by a 41% increase in diameter and doubling the number of turns). Since the frequency also varies inversely as the square root of the capacity, the frequency may be halved (wavelength doubled) by doubling both the inductance and the capacity in the tank circuit.

itself. In fact any inductance consisting of 10 turns or more — even a 3500-kc. coil — is likely to sag and be affected by mechanical vibration unless it is at least partially reinforced. One good method of accomplishing this is illustrated in Fig. 5. Each support consists of two pieces of well seasoned hardwood, preferably boiled in parafin, notched to fit over the turns and held in place by three brass machine screws. The strip is prepared by first boring the ¼-inch holes in a

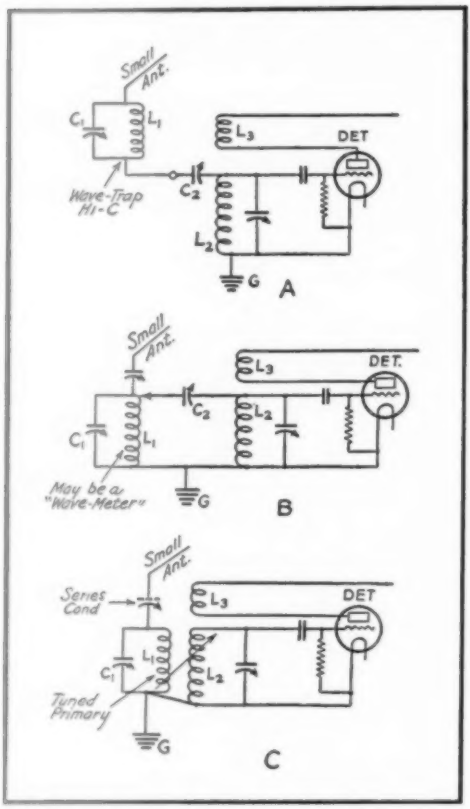


FIG. 6. — SIMPLE STUNTS FOR IMPROVING RECEIVER SELECTIVITY
Their utility is explained in the text.

piece of wood having the dimensions shown and then sawing it lengthwise to make two matched strips. The one illustrated would be suitable for a 13 turn coil of ¼-inch copper tubing with ⅛-inch spacing between turns. The dimensions can be modified for larger tubing and different spacing. Two or three of these supports equally spaced about the circumference of a coil made of copper tubing or large wire will give it adequate stiffening.

Inductances of smaller copper wire or tubing can be wound on and supported by composition forms of the proper size. Another good type of rigid coil construction for small conductors is that in which the support is provided by celluloid strips cemented to the turns. Such coils are described in W9DAX's station description in January *QST*.

GRID COILS AND R.F. CHOKES

The grid coil for a 1750-kc. TNT oscillator will have approximately 2.5 times as many turns, on the same diameter form, as for 3500-kc. operation, the exact number of turns being determined by experiment.[3] Radio-frequency chokes do not present much of a problem at frequencies in the 1750-kc. band and may be wound according to the data given at the end of Chapter VII, Seventh Edition, Radio Amateur's Handbook. Usually about 300 turns of No. 30 d.c.c. or d.s.c. wire on a 1-inch diameter form will prove satisfactory. In lieu of single-layer home-made chokes, some amateurs prefer commercially manufactured r.f. chokes of the "short-wave" type.

COUPLING, BLOCKING AND BY-PASS CONDENSERS

It really shouldn't be necessary to go into any great detail concerning the transmitting fixed condensers, but perhaps a few suggestions will allay some doubt about them. Something on the order of .001 μfd. will be generally satisfactory for the grid condenser and plate-blocking condenser (if one is necessary) in the oscillator, while filament by-pass condensers may be .002 μfd. or larger. Inter-stage coupling condensers in oscillator-amplifier sets are not critical as to value, between 500 μμfd. and .002 μfd. being generally satisfactory. Condensers required to carry r.f. current should be of a type designed for that work. Only good grade mica or air dielectric condensers should be used, particularly in the plate blocking position (shunt feed) and as the inter-stage coupling condensers in oscillator-amplifier sets. In general, the same specifications as for the higher-frequency bands apply, with due allowance for the difference in frequency.

RECEIVERS — SELECTIVITY

Since the 1750-kc. band lies quite closely adjacent to the high-frequency end of the broadcast band, the possibility of interference from neighboring broadcast stations is to be expected with a receiver that hasn't better selectivity than that of the customary single-circuit amateur rig. Moreover, since a large part of the 1750-kc.

[3] The distributed capacity of the grid coil and the input capacity of the tube affect the tuning of the grid coil. These factors are influenced by so many things (type of tube, stray wiring capacity, operating plate impedance, size of wire, etc.) that it is practically impossible to give exact coil specifications. The process of trial and error is easy, however, the proper number of turns being determined by starting with plenty and removing turns until the oscillator plate current is minimum at the low-frequency end of the band. The oscillator should be loaded during the adjusting process.

activity is and will continue to be 'phone communication, better than ordinary r.f. selectivity is desirable even under the most favorable conditions; not much less than two tuned circuits, aided by the additional selectivity which a regenerative detector provides, is likely to be able to separate the wheat from the chaff. The additional tuned circuit need not be necessarily a stage of tuned r.f. The elimination of a single interfering signal may require nothing more elaborate than the simple wave-trap shown in Fig. 6 *A*; better selectivity all around will result with the pinch-hitting wave-meter scheme of *B*; and some may prefer the inductively coupled tuned antenna coil of *C*. The last will remind old timers of the well-known two-circuit tuners of a former day. And did they have selectivity? The idea is not so readily applicable to receivers using plug-in coils, unless the coupling can be adjusted to the proper value, and the arrangement shown at *B* will be more generally adaptable to existing receivers of the single tuned-circuit type.

A receiver having the usual type of untuned-grid coupling stage ahead of the detector isn't much better off than a straight single-circuit detector receiver when it comes to selectivity and is quite likely to be worse. The obvious solution of the selectivity problem in this case is to supplant the untuned grid resistor, or choke, with a tuned circuit. This increases both the gain and selectivity of the r.f. amplifier, the increased gain being perhaps to the detriment of the selectivity unless a really small receiving antenna is used. But then a regenerative set with a good stage of tuned r.f. will have sufficient sensitivity to permit the use of but a few feet of wire as the receiving antenna; and the background noise in most locations will make impossible the use of a large antenna anyway.

TUNED CIRCUITS — HOW MANY TURNS?

Several receivers intended for 1750-kc. use have been described in recent *QST* articles and also in the Radio Amateur's Handbook, 7th Edition, and the coil specifications given therein can be used as a guide. For instance, the detector coil for the little two-tube receiver described in the December, 1930, issue has a grid winding of 70 turns of No. 32 s.c.c. on a 1½-inch diameter National coil form and a tickler of 10 turns. The tuning condenser actually utilizes 7 of the 18 plates of a remodeled tuning condenser that had a normal maximum capacity of 90 $\mu\mu$fd., reduced to approximately 40 $\mu\mu$fd. by the process of removing stator plates. As a general rule, a tuning condenser of 50-$\mu\mu$fd. maximum capacity will cover the 1750-kc. band nicely with a 60- to 70-turn grid coil unless there should be circuit conditions causing an unreasonably high minimum capacity. The use of an r.f. stage will increase the minimum capacity shunting the detector grid coil, because of the r.f. amplifier tube's plate-filament capacity, but this will amount to only 10 or 15 $\mu\mu$fd. for Type '22 and '24 tubes and will not seriously affect coil and condenser specifications which allow a fairly generous band-spread without covering the whole dial.

Coils for the first detector of a superhet receiver or converter will be quite similar to the detector and r.f. amplifier coils of regenerative receivers, but the oscillator coil specifications will depend on the super's intermediate frequency. The specifications of 1750-kc. oscillator and first detector coils for an intermediate frequency of 300 kc. given in the superhet article that appeared in *QST* for March, 1929, may be used as a guide.

TUNING UP

Every good station will have a calibrated 3500-kc. monitor or heterodyne frequency meter that will serve nicely for 1750-kc. tuning adjustments, at least between 1750- and 2000-kc. limits. The second harmonic of the transmitter can be picked up in the monitor and easily identified by dividing by 2 the frequency of the 3500-kc. monitor calibration for that point. Another method of setting the transmitter would be to tune its second harmonic to zero beat with a 3500-kc. band signal from a heterodyne frequency meter, using a receiver tuned to 3500 kc. for the pick-up. If the transmitter's second harmonic is a strong one or if the signal from the frequency meter paralyzes the detector, it may simplify things to adjust the receiver's regeneration control so that the detector is non-oscillating and regenerating weakly. In a pinch, a less accurate but still useful frequency check can be made with an absorption type wave meter. A few minutes of experimenting will show the tuning method best adapted to a station's frequency measuring and transmitting equipment.

New England Division Convention

Boston, Mass., April 24th-25th

THE Eastern Massachusetts Amateur Radio Association cordially extends to all amateurs an invitation to attend this year's convention which it is sponsoring at the Hotel Bradford, Boston, Mass., on Friday and Saturday, April 24th and 25th, respectively. A wonderful program has been prepared which includes good talks by prominent radio engineers; visits to the Navy Yard, stunts, etc.

Those of you who attended the last convention know what the Boston "gang" can do, and they will not fall down on the job this year. The price of $5.00 will admit you to every meeting, trips and banquet.

Further information may be obtained from Miss Gladys G. Hannah, Secretary, 48 Lake View Ave., Cambridge, Mass.

Active Stations in the Transcon Relay

An Exposition of Present-Day Amateur Radio Equipment

ONE of the most exciting and hard-fought transcon relays in our history is over — but we'll bet it's not forgotten by the participating stations. The following pages show views of some of the outstanding stations and tell something about their equipment. With the limited space available we can't begin to do justice to each of them, but the photographs tell most of the story. There is no particular order here except that dictated by the magazine layout — just what each station did is recounted elsewhere in this issue.

Here they are — the heroes of the transcons!

W6BI-W6NK

The hobby of Leroy F. Watson, Berkeley, Calif., owner of W6BI-W6NK, is traffic handling, and the station has, therefore, been built with that in view. The transmitter is a conventional High-C tuned-plate tuned-grid outfit, using a pair of Type '10 tubes in parallel, working on 3.5, 7 and 14 mc. Plate power is derived from an R.C.A. Kenotron full-wave bridge rectifier and filter, and the drain is such that it is never worked to full capacity.

The receiver is a regenerative detector with one audio stage, using W.E. 231-D tubes. A Navy Type SE 1012-A receiver with a one-stage audio amplifier is used to cover ships and the broadcast band. There is also a CW 938-A 'phone transmitter and receiver which is built for use in the 160-meter band.

W6BI's antenna is a 65-foot Zepp.

W9BNT

W9BNT is the Corps Area Net Control Station for the 7th Corps Area, A.A.R.S., located at Fort Omaha, Nebr. The operators are Lieut. H. P. Roberts, of KA1HR fame, and Private Harold Taylor.

The main transmitter is a 500-watt crystal-control outfit. The 3930-kc. crystal controls a 50-watt tube (Type VT-4B), the output of which is fed into a 100-watt intermediate amplifier and thence into the final stage employing two 250-watt VT-22 tubes. A 100-watt t.p.t.g. transmitter works on the 1.75-mc. band. A single-wire fed Hertz antenna is used on the 3930-kc. transmitter, the antenna being about 150 feet high and the feeder 200 feet long. A 130-foot vertical Marconi antenna is used on 160 meters.

One receiver is a Navy Type SE-2511, using one r.f. stage, detector and two audio, with "peanut" tubes, and the other a Signal Corps Type GL, with a Type '22 r.f. stage, 841 detector, and two audio stages using Type '10 tubes. Both transmitters and receivers are operated at the same time.

Colonel Goodwin Compton, Signal Corps, is the 7th Corps Area Signal Officer in charge.

W7ALM

Prior to the transcons, W7ALM worked only on the 7- and 14-mc. bands, but got on 3500 with a bang for the contest. The station is owned by Chester A. Lamont, Astoria, Oregon, an old pre-war spark man.

The transmitter is a High-C tuned-plate tuned-grid outfit using a Type '04-A tube. To supply plate power the output of a 750-watt, 3000-volt transformer is passed through a pair of Rectobulbs, thence through a 4-henry choke and a brute-force filter.

Two transmitting antennas are used; both with single-wire feeders. The fundamental of one is in the 3500-kc. band, and the other in the 7000-kc. band.

A stage of tuned r.f., regenerative detector and one audio comprises the receiver. The first tube is a '22, the detector a '12, and the amplifier a Type '01-A.

W7ALM has been QSO 18 countries in five continents.

W7AAT

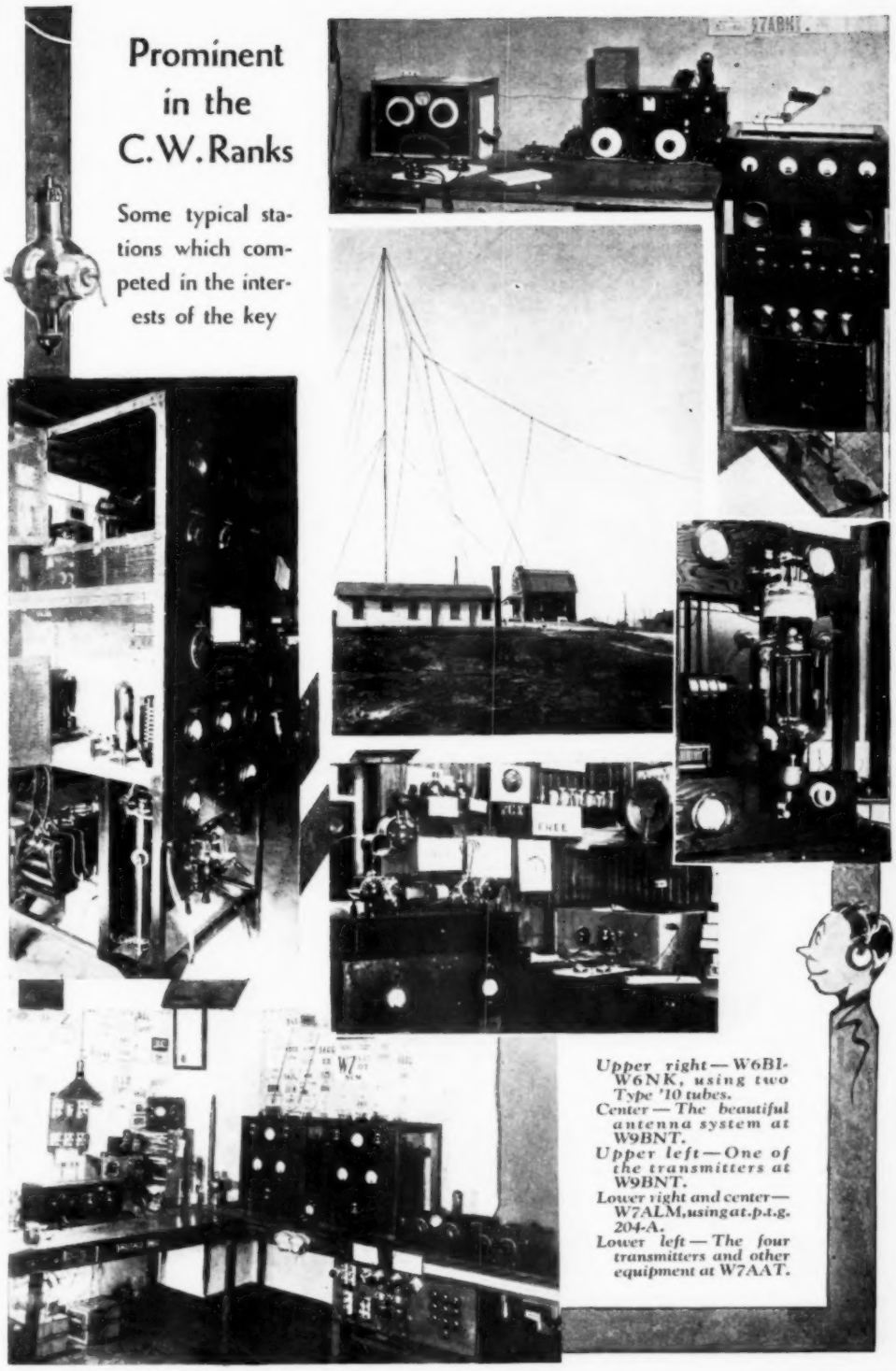
This station is located at Red Lodge, Mont., and is owned by Orville W. Viers, S.C.M. of Montana. There are four transmitters, all High-C tuned-plate tuned-grid rigs. The transmitter used in the transcons (at left in the photo) uses a Type '03-A tube with 1000 volts on the plate. The set next in line is similarly constructed, but employs a Type '52 tube. Either transmitter may be used on both 3.5 and 7 mc. The third transmitter uses a Type '03-A and works on either 7 or 14 mc. The "baby" set at the extreme right is a portable outfit using a single Type '10 tube.

The power transformer for the larger transmitters gives 1000 and 1500 volts each side of the center-tap, and is rated at 750 watts. A 500-volt transformer with self-contained filament windings is used for the small set. The Rectobulb filaments are heated from a separate 300-watt transformer. The filter has an 18-henry choke and two miles of condenser.

The receiver is a regenerative detector and two audio stages, using Type '01-A tubes with battery supply.

Prominent in the C.W. Ranks

Some typical stations which competed in the interests of the key



Upper right—W6BI-W6NK, using two Type '10 tubes.
Center—The beautiful antenna system at W9BNT.
Upper left—One of the transmitters at W9BNT.
Lower right and center—W7ALM, using at p.a.g. 204-A.
Lower left—The four transmitters and other equipment at W7AAT.

W7ANT

W7ANT is a crystal-controlled 'phone station owned by Jack Thompson, Great Falls, Mont.

In the transmitter, a Type '10 crystal oscillator is followed by a Type '65 buffer, which excites the modulated amplifier, a Type '52. The modulator is a W.E. 212-D tube, with three stages of impedance-coupled speech amplification between it and the mike. The latter is a Universal double-button.

A 2000-volt Thordarson transformer, Rectobulbs, and a brute force filter make up the power supply.

The receiver is a d.c. Super-Wasp.

W7ANT has worked all U. S. and three Canadian districts, contacting stations in 41 states in the process. The station has also been heard in Alaska and New Zealand.

W5PP

W5PP, owned by L. F. McCollam, Medicine Park, Okla., is a crystal-controlled 'phone station. The crystal oscillator uses a Type '10 tube with 200 volts on its plate, and feeds a Type '03-A buffer amplifier run at 750 volts. The buffer in turn excites another '03-A in the modulated amplifier stage. The plate voltage on the last tube is 1000. The modulator is a W.E. 212-D with 1300 volts on its plate, and is fed by three stages of speed amplification employing a Type '01-A, a '12-A and a '50. The first two stages are transformer-coupled. The microphone is a Universal KK.

Type '66 rectifiers are used in the power supply unit, with a brute-force filter smoothing the output. The antenna is a 132-foot Zepp with 70-foot feeders, and is supported between two 40-foot masts.

The receiver is the usual regenerative detector and two-stage amplifier, using Type '01-A tubes. A power amplifier employing a Type '10 can be connected to the receiver for loudspeaker reception. A monitor is available for checking the transmitter.

W8AKW

W8AKW is a well-known Ohio station, owned by R. L. Tedford, of Cincinnati. It is a crystal-controlled outfit, using a Type '10 oscillator, a Type '10 buffer, and a W.E. 211-E modulated amplifier. All stages are completely shielded. Two 211-E's are used in the modulator. The speech amplifier is a two-stage affair, using a Type '27 in the first stage and a '45 in the second.

Plate power for the modulators and modulated amplifier is obtained from an 1100-volt power supply using Type '66 rectifiers. The full 1100 volts is used on the modulators, but the voltage is dropped to 850 for the modulated amplifier. A 600-volt supply using Type '81 rectifiers takes care of the buffer and oscillator, the plate voltage on the latter being dropped to a value which is safe for the crystal.

The antenna is a 132-foot Zepp, bent in the form of a "Z" on account of space limitations. The feeders are 50 feet long.

A four-tube a.c. receiver, consisting of an untuned Type '24 r.f., '24 space-charge detector, '27 first audio and '71-A second audio, is used. An accurately-calibrated heterodyne frequency meter is also part of the station equipment.

W3WI

This station, owned by Elmer T. Ellis, Seaford, Del., participated in the relay with the 'phone group. The transmitter is crystal-controlled, using a Type '71-A oscillator, neutralized Type '10 buffer amplifier, and a Type '10 modulated amplifier, the latter being run at 600 volts. The modulator is a W.E. 211-D, operating at 850 volts. A W.E. 337 microphone is used, followed by a single stage of speech amplification using a Type '71-A tube.

The power supply uses a pair of Type '81 rectifiers, with a brute-force filter employing electrolytic condensers. Separate filament transformers are used on all tubes in the transmitter except the '71 A's. "B" eliminators supplying 180 volts furnish the plate power for the crystal oscillator and the speech amplifier. The antenna is a 132-foot Zepp, 48 feet high, with 59-foot feeders.

The receiver is a two-tube Handbook affair, followed by a W.E. 7-A amplifier for loud-speaker operation.

W9ESL

This station, which works 'phone or c.w. on 1.75, 3.5 and 7 mc., is owned by Rev. Romuald Fox, O.S.B., Valley Falls, Kansas. There are two transmitters, both crystal-controlled.

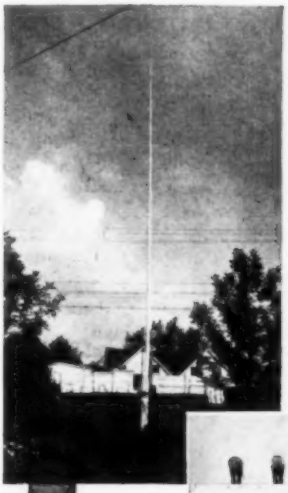
The main transmitter, used on 1.75 and 3.5 mc., uses a Type '10 crystal oscillator, Type '10 buffer, and '03-A power amplifier, the latter being modulated for 'phone work. The modulator is a W.E. 212-D tube. The buffer, modulated amplifier and modulator obtain plate power from the same supply, with suitable dropping resistors so that the 212-D works at 1650 volts, the '03-A at 1250, and the buffer at 400 volts. A "B" eliminator supplies the crystal oscillator. The speech amplifier is a Silver-Marshall 685 public address amplifier, using a Type '27, a '26 and a '50, with a power pack using a pair of '81 rectifiers. Either a Universal double-button mike or a home-made condenser mike can be used.

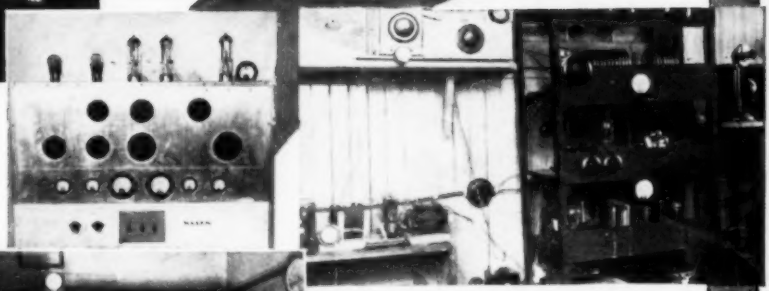
The second transmitter uses a Type '10 oscillator, a Type '10 buffer or doubler, and a Type '10 power amplifier, the last tube being run at 750 volts. This set is used for 3.5- and 7-mc. c.w.

The receiver is a Dresner converter unit with '12-A detector, two '12-A audio stages, and a Type '10 power amplifier. The latter is used for

For the 'Phone Cause

Five crystal-controlled stations which contributed much to the success of the 'phone relay work. There is no doubting the upward trend in 'phone station equipment indicated by these typical examples





Top — W7ANT, using a modulated Type '52 amplifier — the modulator a W.E. 212-D tube. A suggestion of the antenna pole and station location is given in the upper left illustration.
Right center — A Type '03-A amplifier at W5PP is modulated by a W.E. 212-D.
Lower right — At W3WI the modulator is a W.E. 211-D. A Type '10 tube is the modulated amplifier.
Alongside W3WI — A pair of W.E. 211-E tubes modulate a single 211-E amplifier at W8AKW.
Lower left — Again, at W9ESL, a W.E. 212-D modulates a Type '03-A.

loud speaker reception. A tube monitor is used for checking the c.w. signals and 'phone carrier, and a crystal detector for listening to the modulation.

W9EJQ

R. P. Griffith, Goldfield, Iowa, is the owner of W9EJQ, one of the c.w. representatives in the relay.

The transmitter at W9EJQ is a Hartley using a Type '50 tube as the oscillator. Plate power is obtained from a 200-watt Acme transformer, the output of which is rectified by a pair of Type '81 tubes and smoothed out by a pair of 2-μfd. condensers and a 40-henry choke.

There are three antennas at the station, one 62 feet long, the second 66 feet and the third 97 feet. Each is brought directly into the station, and either may be used separately or a suitable combination of any two of them can be made up for any band.

The receiver is a four-tube affair built along the lines of the set described in the Handbook, with an untuned r.f. stage, detector, and two audio, one of which is peaked. A honeycomb receiver is also used to cover the long waves.

W1SZ

W1SZ is the station of Clark C. Rodimon of the *QST* staff, and is located at the Connecticut State Armory, Hartford. The call W1FE is used for Army-Amateur work, the station being N.C.S. for the 1st Corps Area.

The transmitter is crystal-controlled, and may be used on either 3.5 or 7 mc. The oscillator is a Type '10, exciting a Type '03-A doubler, the output of which feeds a pair of '61's in parallel (only one in use when photo was taken). A 1.87-mc. crystal is used for 3500-kc. work, and a 3.55-mc. crystal for 7 mc., making it unnecessary to neutralize the '03-A on either band. Power supply is obtained from a bridge rectifier using four Type '66 tubes, as described in *QST* some months ago.

The transmitting antenna is a half-wave 3500-kc. Zepp. A National short-wave a.c. receiver is used with a short antenna for reception.

W6AM

Don Wallace and W6AM need no introduction to *QST* readers of long standing. The station is located in Long Beach, Calif.

The transmitter is crystal-controlled, and can be worked on 3.5, 7, 14 or 28 mc. The crystal is temperature controlled, and the output of the oscillator excites a 50-watt doubler, which in turn feeds a 75-watt screen-grid tube. The output of this tube excites a 1-Kw. water-cooled tube. This rig is used for 7, 14 and 28 mc. A separate crystal oscillator and amplifier are used to excite the big tube on the 3.5-mc. band.

A three-phase power line comes into the operating room in addition to the regular 220-volt 3-wire system. The several high-voltage transformers are arranged to give six-phase output, which is rectified by six Rectobulbs; this plate supply is used only on the last tube. All other filament and plate power for the set is taken from the regular single-phase supply.

The receiver at W6AM has six tuned stages and as a result has excellent selectivity. The usual monitor and frequency meter are part of the station equipment. That this station works all kinds of DX goes without saying.

W8CUG

W8CUG is the station of C. H. Grossarth, Emsworth, Pa., Route Manger for Western Pennsylvania. The transmitter is crystal-controlled, using an 1810-kc. oscillator with a Type '10 tube, a second Type '10 frequency doubler, and a neutralized power amplifier also using a '10. The power supply for the oscillator consists of a 200-volt transformer, Type '80 rectifier and the conventional filter. For the doubler and amplifier there is a 600-volt bank of Edison storage cells. A tap is taken off at 400 volts for the doubler, the full plate voltage being applied to the amplifier.

The receiver is a four-tube Handbook outfit with some minor changes. A monitor and dynatron frequency meter, the latter using a Type '32 tube, are also part of the station equipment.

The antenna is a Zepp with 15-foot feeders. While not designed for use in the 3500-kc. band, it has been found to work very well used as an ordinary current-feed system.

W9BCA

W9BCA, one of the c.w. group, is owned by W. K. Schafer, Fort Madison, Iowa. The transmitter in use at present is only a temporary rig, as the regular outfit is being rebuilt for crystal control.

The set shown in the photograph is a tuned-plate tuned-grid rig using a W.E. 212-D tube, rated at 250 watts. As the local power mains are 25 cycle, a 125-volt 500-cycle generator was obtained and furnishes the primary voltage for the home-made plate transformer. The rectifier is half-wave, using a Type '66 tube, and there are two 30-henry chokes and a total of 2.5 μfd. in the filter.

The transmitting antenna is a half-wave 3500-kc. Zepp, with feeders which are right for 7000-kc. tuning. The additional feeder length necessary for 3500-kc. operation is obtained by stringing the extra feeders around the room on stand-off insulators.

W9BCA's receiver is a four-tube outfit similar to the one in the Handbook, using a '22 untuned r.f., '01-A detector, '22 peaked audio, and '01-A second audio.

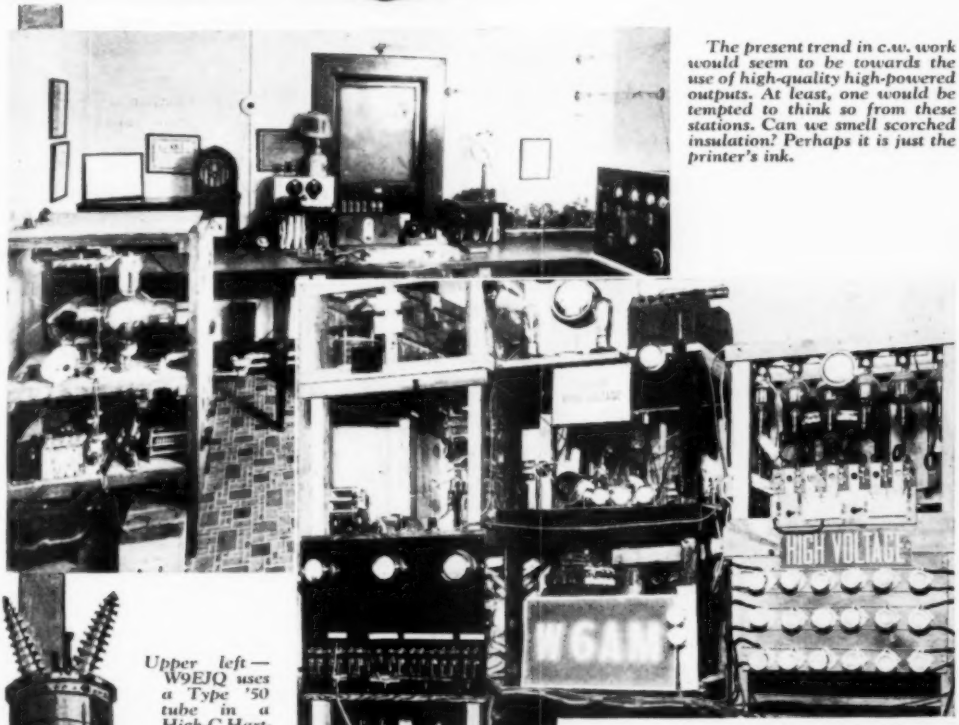
W8AWS

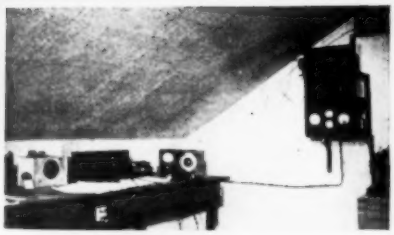
W8AWS is a combination 'phone and c.w. station owned by W. Ward McKinley, Youngs-

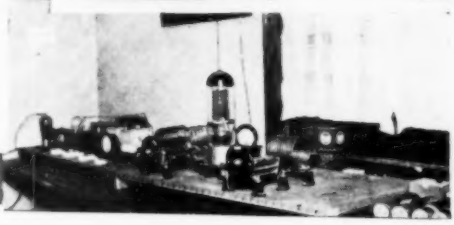
What was that about a High-Power Holiday?

Most of the stations on this page are still hard at work

The present trend in c.w. work would seem to be towards the use of high-quality high-powered outputs. At least, one would be tempted to think so from these stations. Can we smell scorched insulation? Perhaps it is just the printer's ink.







Upper left — W9EJQ uses a Type '50 tube in a High-C Hartley. That is low power but —
Center left — W1SZ only has a pair of '61's in parallel (the second not having been fitted when the photograph was taken).
Right — A 1-Kw. water-cooled tube serves as final amplifier at W6AM. A three-phase power supply helps. And there is a receiver with six tuned r.f. stages.
Below — W8CUG, using a crystal-controlled Type '10 tube and W9BCA, fitted out with a 250-watt W.E. tube in a t.p.t.g. circuit.

town, Ohio. The transmitter is crystal-controlled, and the r.f. part of it is push-pull throughout. A pair of '27 tubes is used in the oscillator, followed by a push-pull buffer using '24's. This excites a second buffer stage in which is a pair of neutralized Type '10's, and this in turn feeds two Type '11 tubes in the modulated amplifier. The modulator tube is a W.E. 212-D.

The microphone is a condenser type and works into a two-stage speech amplifier using Type '40 tubes. The output of this amplifier goes into the regular speech amplifier, which consists of two '12-A's in cascade followed by a Type '50.

A 135-foot Zepp with 67-foot feeders, strung between two lattice masts, one fifty and the other thirty feet high, is used for 3500-kc. work. A vertical Zepp made from a piece of rainspouting is used on 14 mc.

The receiver is a conventional tuned r.f., detector and two audio, using a.c. tubes throughout. A Type '45 tube is used in the last stage to operate the loud speaker, which is used almost exclusively. The station is also equipped with a dynatron frequency meter.

W2BZA

W2BZA is a well-known 'phone station, and is owned by Vern M. Wintermute, Dunellen, N. J. The r.f. portion of the transmitter consists of a Type '10 tube in a High-C Hartley circuit, a neutralized buffer amplifier also using a Type '10, and a Type '03-A modulated amplifier. The transmitter is kept on frequency by a separate crystal oscillator which is monitored against the self-excited oscillator in the transmitter.

A W.E. double-button microphone feeds a two-stage speech amplifier using Type '12-A tubes, the second stage being resistance coupled. This amplifier is built in a shielded box located near the microphone on the operating table, and its output is fed through a 200-ohm line to the final speech amplifier mounted in the transmitter frame. This last amplifier also has two stages, one using a Type '26 tube and the other two '45's in push-pull. The output of the '45's goes to the grids of the two W.E. 211 tubes used as modulators.

The receiver is an 8-tube superhet using an S.M. 440 time signal amplifier as the intermediate.

The high-voltage supply is located in the cellar and is operated by remote control; 1500 volts a.c. is put through a mercury-arc rectifier and filtered to pure d.c. Dropping resistors supply the correct plate voltages for the various stages except the master oscillator, which has its own 350-volt plate supply.

W2BZA has worked all U. S. districts and has been heard in England.

W4PW

Clyde S. Pleasants, Guilford College, N. C., owns W4PW, a 50-watt 'phone station. This is another crystal-controlled outfit, using a Type '10 shielded oscillator, a Type '65 buffer, and a Type '03-A modulated amplifier. Two 845's in parallel are used in the modulator, coupled to the modulated amplifier through a double modulation choke.

A 350-volt power pack supplies plate power for the crystal oscillator and the speech amplifiers. A 1000-watt Thordarson plate transformer is used in conjunction with a pair of Type '66 rectifiers, two 30-henry chokes, and a total of 8 μfd. of 2000-volt condensers to supply the plates of the modulators and the modulated amplifier. A separate 300-volt power pack supplies bias voltages for the buffer, modulator and modulated amplifier through heavy-duty potentiometers which allow regulation of the bias on each tube.

The receiver, a Super-Wasp, is built into the lower part of the transmitter frame.

W4TM

This station is a real high-power 'phone outfit. It is owned by L. K. Rush, Bemis, Tenn., who has been active in ham radio since 1919, having held the calls 5CN and 4KM previously, as well as being ADM and SCM of Tennessee.

The r.f. part of the transmitter employs a Type '10 crystal oscillator, two buffer stages using '10's, a Type '03-A modulated amplifier, and a 500-watt linear amplifier using two W.E. 212-D tubes. An 845 is used in the modulator, fed by a Type '50 which can be coupled to either of two speech amplifiers, depending upon the microphone in use. One is a simple transformer-coupled stage using a Type '01-A tube, which is used with single-button microphone and the other is a three-stage affair with a '12-A; '71-A and '10 in line before the '50 is reached. The latter is used with a W.E. 387 double-button mike.

The linear amplifier gets its power from a 2000-volt, 1500-watt Esco M.G. set, while the buffers, modulated amplifier, modulator, and the '50 speech amplifier are supplied by a 1250-volt, 650-watt Esco machine. The modulator plate voltage is 1250, and the modulated amplifier 600.

The receiver is a.c. operated, using a Type '24 detector, a Type '27 resistance-coupled amplifier, and another '27 transformer coupled. A monitor and frequency meter are in use, the latter being calibrated from Standard Frequency Transmissions.

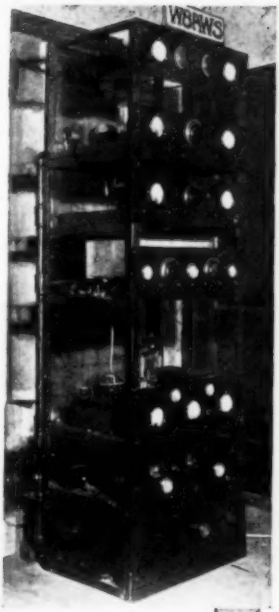
W3UK

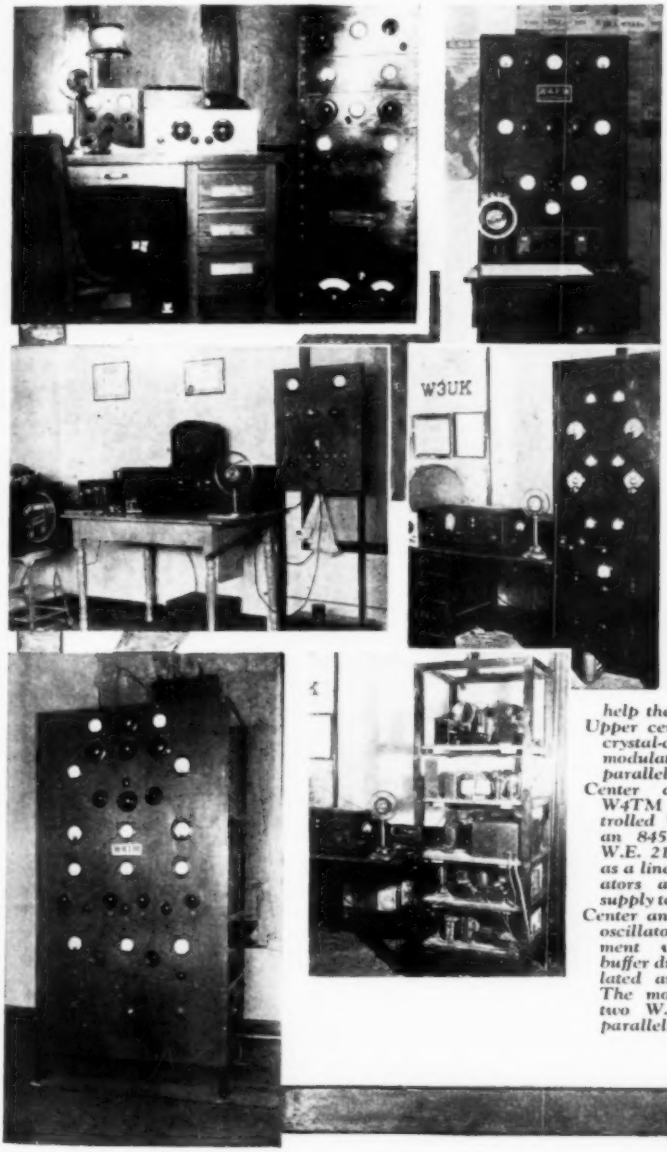
W3UK is another typically modern amateur 'phone. Paul Todd, of Somerville, N. J., is the owner of the station.

The transmitter, which has a nominal carrier rating of 50 watts, employs a High-C Hartley oscillator working on 160 meters, a Type '10 doubler, another Type '10 neutralized amplifier,

Convincing Evidence That Ham 'Phone Has Gone Modern

A further random selection of typical stations operated in the contest in defence of the mike





Top right — A condenser microphone, a W.E. 212-D modulator and two Type '11 tubes as the modulated amplifier constitute the essentials of W8AWS.

Top left — A Type '03-A amplifier, driven by a self-controlled oscillator and buffer amplifier, is modulated by two W.E. 211 tubes at W2BZA. A W.E. microphone and a super-het. help the cause along.

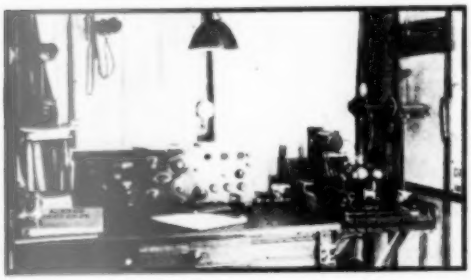
Upper center — At W4PW a crystal-controlled '03-A is modulated by two 845's in parallel.

Center and lower left — W4TM has a crystal-controlled '03-A, modulated by an 845 and feeding two W.E. 212-D tubes arranged as a linear amplifier. Generators are used for plate supply to all the bigger tubes.

Center and lower right — An oscillator-amplifier arrangement with doubler and buffer drives the '03-A modulated amplifier at W3UK. The modulator consists of two W.E. 211-E tubes in parallel.

and a modulated amplifier stage using a Type '03-A tube.

Two W.E. 211-E tubes in parallel are used in the modulator, with 1250 volts on their plates. Four stages of speech amplification are used, the first two being battery operated, using Type '30

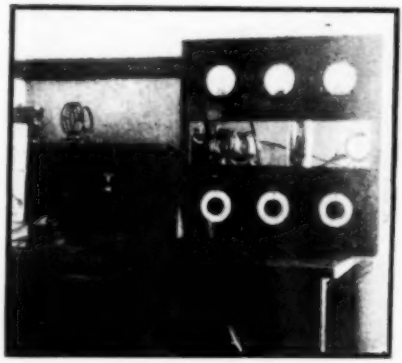


W9COS

tubes. The last two stages are a.c.-operated, using a Type '27 and a '45. Two microphones are used, one a Universal BB and the other a W.E. 399-A, single button.

Separate well-filtered power supplies are used for the modulator and modulated amplifier, doubler and buffer, master oscillator, and the speech amplifiers. The antenna is a 3500-kc. voltage-fed Hertz.

The receiver is a tuned r.f. outfit using a Type '24 in the r.f. stage, '12-A detector, '01-A first audio and '12-A second audio. The transmitter is monitored by means of a simple rectifier using a Type '80 tube. A dynatron frequency meter, accurately calibrated from Standard Frequency Transmissions, is used for frequency measurement.



VE1DQ

W9COS

W9COS is owned by Carl Frank, Rochester, Minn., whose chief hobby is traffic handling. For this reason the station is laid out for convenient operation and is built to stand the gaff of regular and continuous operating. The fact that the station has never had a breakdown in four years of rather heavy operating speaks well of the job.

The transmitter is a High-C Hartley using a Type '52 tube. Power supply is obtained from a 2200-volt transformer, the output of which is rectified by a mercury arc. The rectified d.c. is passed through a filter consisting of a 40-henry choke with a 2.5-μfd. high-voltage condenser on each side. Normal input to the tube is about 200 watts.

Two transmitting antennas are used, one a current-fed bent Hertz on the 3500-kc. band, and the other a 7000-kc. Zepp.

The receiver is the conventional detector and two-step, and a long-wave receiver is also available.

VE1DQ

A. M. Crowell, S.C.M. of the Maritime Division, is the owner of VE1DQ. The station works both 'phone and c.w., VE1DQ taking the side of the 'phone men in the relay.

The transmitter is crystal-controlled, using a Type '10 oscillator, Type '10 buffer, and a W.E. 211-D modulated amplifier. A W.E. 211-E is used as a modulator, fed by a two-stage speech amplifier using a.c. tubes. A single-button microphone is used. High percentage modulation is obtained by running the plate voltage about 300 volts higher on the modulator than on the modulated amplifier. Doublers are used to put the transmitter on 14 mc. for 'phone work. A Zeppelin antenna is used for all bands. Separate power supplies are available for the crystal oscillator and the amplifiers.

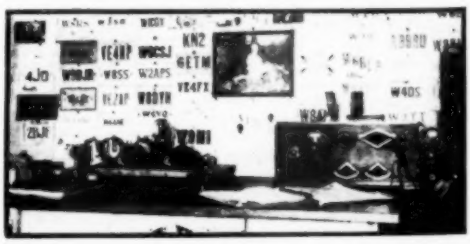
On c.w. all continents with the exception of Asia have been worked. On 3500-kc. 'phone all U. S. and all Canadian districts with the exception of the fifth have been QSO'd. Several good contacts with England on 14-mc. 'phone were made as far back as 1926.

VE3GT

VE3GT was Canada's c.w. representative in the relay. The station is owned by S. B. Trainer, Jr., and is located in Toronto.

The transmitter uses a Type '10 tube in the well-known TNT circuit, with plug-in grid and plate coils for each band. A midget condenser is connected across the grid coil to help out in getting the grid circuit just right. The power supply consists of a 750-volt transformer, a pair of Type '81 rectifiers, and

(*Continued on page 66*)



VE3GT

The Crew at LaSalle Road

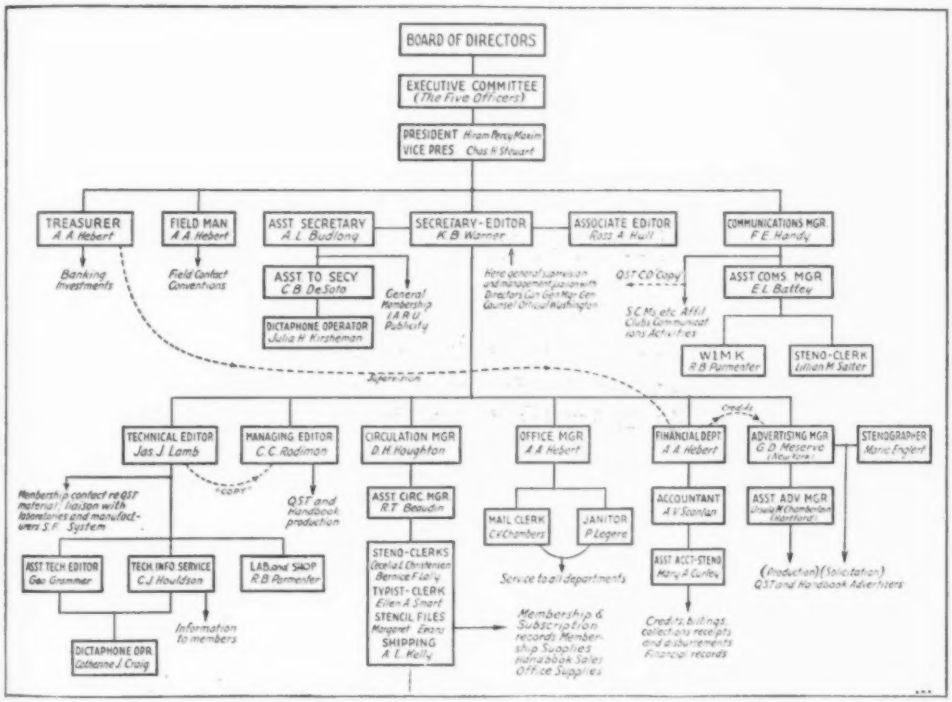
The Plant and People Behind the League and "QST"

By Ross A. Hull*

BACK in 1923 the present writer was one of a group of Australian amateurs, wild with enthusiasm and working desperately to put signals into America in answer to those already heard. *QST*, newly discovered by us, was still almost too good to be true. A whole magazine devoted to amateur radio and run by a group of genuine amateurs — it was a strange phenomenon to us, limited, as we were, by insufficient numerical strength to run anything but a club. This League, we wondered — just what sort of an outfit was it? And the fellows who wrote the magazine and produced it — who were they?

was more than reading, of course; it was a form of complete absorption. To this day I can remember whole paragraphs of that story — and I have not looked at it in seven years.

It is amusing now to know that the 1924 story of the Hartford Crew was the cause of many editorial discussions at Hartford and that it barely got printed, so torn was the staff between the demand that they describe the Headquarters in *QST* and their feeling that it was an editorial impropriety to devote magazine space to themselves. To me, and doubtless to every other active amateur of the day, it was the grandest piece of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THE COMPLETE WIRING DIAGRAM OF THE A.R.R.L.

Later, the January 1924 *QST* came to light. It contained an article, tucked away towards the back, "The Crew at 1045 Main Street." In our enthusiasm, the reading of it, like the reading of many preceding articles, was something in the nature of a religious rite to be observed only in the privacy of a radio shack with locked door. It

information that ever came along. To-day I find myself a member of that headquarters staff, and with renewed demand that the members be told something about their new headquarters office and the staff changes of the past seven years, it has fallen to my lot to write the story. I confess I approach the job with some trepidation.

The history of the League has been one of con-

* See Footnote on page 44.

stant progress. Its pre-war Headquarters consisted of a couple of rooms in the attic of the home of its first secretary-editor, C. D. Tuska, then a college lad. After the war the League got going again, its initial capital being $90 pitched into a hat at a New York Board meeting, which money was used to finance the now-famous membership loan which purchased *QST* and gave the new start. The first post-war Headquarters comprised Secretary-Editor Warner and a couple of shabby rooms on down-town Main Street in Hartford. First there was added a stenographer, then an assistant and soon yet another stenographer. By 1921 the place had grown so much that a move was made to new quarters on upper Main Street. The organization was enormous. An amateur radio league with a staff of five men! Along in 1924 the staff had grown to a total of nineteen and there was still too much work to be done and insufficient space to do it in. The year 1925 saw the move to the Park Street address, the address which has been carried by probably a million letters and many million *QST*'s since then.

But even the 1711 Park Street place couldn't live forever. More space was needed, more modern equipment, and a better location for experimental radio work. And so, just a few months ago, the LaSalle Road offices came into being in a spanking new building designed for the purpose, fitted out especially to suit the requirements and providing just enough elbow-room for everyone. In this building, the League occupies the whole of the large second floor, together with a storage room on the roof, connected by a freight elevator. The whole unit is big enough to be quite an imposing suite, yet sufficiently compact to be a cosy and highly practical habitat. No enormous and ornate façade greets the visitor; no ponderous revolving doors or Gothic foyer with groined ceiling exist to impress him with the magnificence of League Headquarters. But the place is inviting, even so.

From the reception hall a corridor extends the full length of the building. At intervals all the way down, on both sides, glass-topped doors give to the sanctum sanctorums of all the Headquarters Crew. Of heavy-carpeted and gilded dignity there is none. Bright walled, brilliantly lighted, and furnished in severe simplicity, these offices are essentially places to work in. At all hours of the day and most hours of the night there is a subdued jangle of activity. The "wham-wham-wham" of duplicating machines churning out their circulars and bulletins, the constant milling of typewriters, the chanting into many dictaphones, and the thumping of some addressing machine — all contribute to that conglomeration of noises which is characteristic of work being accomplished rapidly. From the laboratory at the far end of the building there may be the whine of a generator and the wail of a monitored transmitter — sounds which can be depended on to continue far into the night.

THE CIRCUIT DIAGRAM

Few amateurs have any appreciation of the magnitude of their League or of the necessary ramifications of its headquarters establishment. Small as it may be in terms of "big business," it is large for an organized hobby. It requires sound business management, for it is a large enterprise, turning over nearly $200,000 annually, requiring a headquarters personnel of 28 full-time employees to serve its membership, and having to date disbursed over two million dollars in advancing the welfare of the members who are its owners.

THE LASALLE ROAD OFFICES AS SEEN FROM ABOVE—

Had the reader been blown eighty feet into the air astride a flying roof timber one split second after the roof lifted he would have seen:

A — K. B. Warner, chanting into his Dictaphone.
B, C, D — The other members of Secretary-Editor's office staff: Budlong, DeSoto and Mrs. Kirsheman respectively.
E — Miss Bernice Lally at her desk in the entrance lobby.
F — Vernon Chambers, Office Boy, emerging from his office to go places.
G — Miss Chamberlain, Assistant Advertising Manager.
H, I, J — The Communications Department office with Ed. Handy, Miss Salter and Everett Battey bearing the letters in the order given.
K, L, M — Mr. Hebert, Miss Curley and Miss Scanlan of the Financial Department.
N, O — Clark C. Rodimon, Managing Editor and the present writer's desk.
P — Office of Technical Editor Lamb; Miss Craig scanning correspondence James occupied in Laboratory.
Q — The Sanctum of George Grammer and Clyde Houldson — Clyde busy at the book-shelf, George in the Laboratory.

In the first growing days of the headquarters, increase in personnel came about by the growing need for further subdivision of Secretary Warner's duties, as business increased. For many years past, of course, the headquarters has been divided into efficient departments, as with any well-organized establishment, each having its own clear-cut functions but all inter-related, and all of them functioning to-day under his direction except the Communications Department and the treasuryship. Then these three sections of the headquarters are directed by the Executive Committee, and it in turn of course by the Board of Directors.

On page 41 is the schematic diagram of the League, the hook-up of the whole works. A certain resemblance to a crystal controlled transmitter is at once seen. The box at the top, labelled "Board of Directors" is really the controlling element, the crystal. All the doohickies after it are, in a sense, amplifiers. All of them accomplish work of their own and each provides excitation for the next department in line. But all of them are crystal-controlled by the Board of Directors. And the Directors, of course, are nominated and elected by League members. As everyone knows, the Board has an annual two-day meeting in Hartford where plans and policies are made and the officers instructed. What everyone doesn't know is that the Directors are never out of touch with Headquarters. A formidable amount of correspondence is handled throughout the year between the Secretary and the Directors, both individually and collectively; they receive many reports and also copies of all letters leaving Headquarters for amateurs in their respective Divisions.

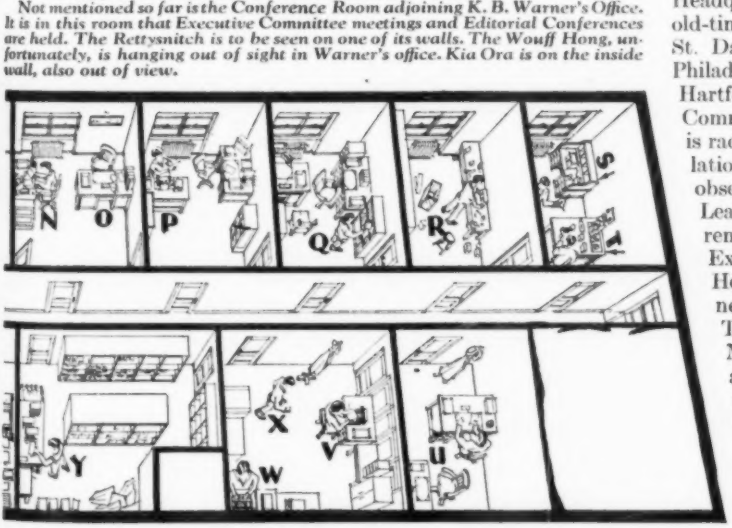
Between the meetings of the Board an Executive Committee functions at Headquarters, consisting of the five officers of the League. Within carefully prescribed limits it is authorized to carry out the plans and instructions of the Board, reporting constantly to the Board and referring to it whenever further instructions are necessary. This Committee directly supervises Headquarters' activity and perhaps its chief function is guiding, from week to week, the activities of the Headquarters along major plans that the Board has laid down.

Hiram Percy Maxim, the man who originally conceived the idea of the League and who has been our beloved President all these years is, of course, Chairman of the Board and of the Executive Committee. He is not a member of the Headquarters Staff and his job is an honorary one. Mr. Maxim has a suite of offices downtown for his own business (Maxim Silencers), but he is a frequent visitor at Headquarters where the really hard problems are saved for him. He has devoted a great deal of his time to A.R.R.L. and he keeps himself thoroughly informed on our activities, always bringing us a fresh viewpoint and new inspiration.

Vice-President Charles H. Stewart, the second honorary member of the Executive, like Mr. Maxim has no desk at Headquarters. One of the very old-time amateurs, he lives at St. David's, Pa., a suburb of Philadelphia, and comes to Hartford for the Executive Committee meetings. His forte is radio regulations and legislation, and he is a consistent observer on behalf of the League at Washington. The remaining members of the Executive Committee are Headquarters men — Warner, Hebert and Handy. They join forces with Messrs. Maxim and Stewart in the League's committee room every so often, to figure out how to comply with the Board's instructions in the matters that are under way.

AFTER-EFFECT OF A CONVENIENT IMAGINARY CYCLONE

R — The work-shop, with Robert Parmenter admiring one of his latest creations.
S, T — James Lamb and George Grammer discussing some abstruse problem in the Lab.
U — The Circulaton Manager's office — Dave Houghton in evidence.
V, W, X — Miss Christensen, Miss Smart and Ralph Beaudin in one of the Circulation Department offices.
Y — The shipping room with Arthur Kelly ready to go. (Artistic license permits us to clean up this room. Usually it is piled high with Handbooks, Booklets, QST's and mail bags.)
Z — The Circulation Department File Room. Margaret Evans at one of the files — a suggestion of the new addressing machine behind her.
Not mentioned so far is the Conference Room adjoining K. B. Warner's Office. It is in this room that Executive Committee meetings and Editorial Conferences are held. The Rettysnitch is to be seen on one of its walls. The Wouff Hong, unfortunately, is hanging out of sight in Warner's office. Kia Ora is on the inside wall, also out of view.



THE SECRETARY-EDITOR'S OFFICE

It is hard to write a paragraph about Warner, a man whose name, together with Mr. Maxim's, is as intimately associated with amateur radio as the vacuum tube. According to the rule book, Warner is Secretary of the League, Business Manager and Editor-in-Chief of *QST*. He is in fact the General Manager of the League and directly in charge of all its activities except the Communications Department and the treasuryship, which belong to his brother officers. Most of us here know him as the one with whom we discuss our plans, ideas and problems. But he has many other duties. He maintains liaison with the President, Vice-President and General Counsel on legislative and regulatory matters; with the latter on legal affairs; with the Canadian General Manager on Canadian matters; with individual Directors on matters both local and nation-wide; and with Official Washington on everything influencing amateur welfare — at which city, by the way, he is a very frequent visitor. That is what being the Secretary of the League means. As business manager, Warner must supervise the League in such a way that *QST* and the Handbook, as pieces of business, provide satisfactory income to be spent in the interests of the amateur. As editor-in-chief of *QST* he has the responsibility for our magazine devoted entirely to amateur radio. To give him something else to think about, he's also Secretary of the I.A.R.U.

K. B. Warner

But these are just so many words. Down at the bottom one finds that the League has become what it is to-day under Warner's management, which dates from the War. In recent years several large corporations have tried to swipe him away from us, but N.D. because, swell executive though he is, he is first an amateur. "K.B.," as he is universally known, was a pre-war "9." From Illinois he drifted east with the Air Service during the war and to make his mark somehow, somewhere. The post-war League is it.

His hobbies include being a reserve Major in the Air Corps and the playing of a golf game at which he hopes to be able to beat all comers some day. At home there are keys and a "bug" to be pounded; coils, condensers and tubes to be juggled and the call W1EH to be signed. And there is a "YF" and two assorted Junior Ops.

Arthur L. Budlong, Assistant Secretary, is, of course, Warner's "side-kick." To his lot fall many matters of the Secretarial Department, the general correspondence with the membership, and the active management of the International Amateur Radio Union. "Bud" is another of the "die-hards," having joined up in early 1924, from Washington, D. C. At that time he was editor of the syndicated newspaper radio service being put out by the League. Later he was Assistant Traffic Manager. During 1924, '25 and '26 he did a whizz of a job in charge of the Pennsylvania Rail Road Emergency Net. At the moment, aside from his office work, he is Radio Aide of the 1st Corps Area Army-Amateur Radio System. Bud's winter hobby is Art. During the summer he turns to boating. He is secretary of the Hartford Yacht Club and often can be seen maneuvering his peanut-sized sloop on the waters of the Connecticut River.

A. L. Budlong

Clinton B. DeSoto, Assistant to the Secretary, is one of the most recent arrivals at Headquarters. He writes the news releases about the activities of amateurs the world over. These stories are distributed weekly to more than a hundred important United States newspapers and to foreign radio magazines. In addition, he conducts the I.A.R.U. department in *QST*, manages the QSL Bureau and looks after the WAC Club. His first station, 9KL, was operated at Withee, Wisconsin, and later at Middletown, Wisc., while Clinton was attending the State University, where he specialized in journalism. We have now discovered that he is Sinclair Lewis in disguise, his ambition being to write the Great American Novel. Meanwhile he has again started ether-busting with a new station under the call W1CBD. His particular interest at the station is experimenting with dizzy circuit arrangements but even this absorbing work has been somewhat curtailed since January when Clinton became a proud father.

C. B. DeSoto

Mrs. Julia H. Kirsheman is the stenographic strong-arm of the Secretary-Editor's Office. In her cosy corner of office No. 1 she listens all day long to the recorded voices of Warner, Budlong and DeSoto and bats out their letters posthaste. She is the "JH" that has appeared on letters from Warner's office most of the time since 1924. Julia has left the League a couple of times to go out into the cold cruel world but she has always come back and we've always been glad. Until last June she signed her letters "JH," but since then there's been a "K" on the end.

Julia H. Kirsheman

THE COMMUNICATIONS DEPARTMENT

With Handy's Handy Handbook behind him and the conduct of the Communications Department of the League during the last five years, F. E. Handy must surely be known by every fellow who ever pressed a key. Attending conventions all over the country has also been a part of Handy's activities during the last few years and because of this he is known "in the flesh" by a wide circle of amateurs. Handy cannot often be heard warbling the "Stein Song" but even so, he came out of Maine by way of the University of

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*Mr. Ross A. Hull is the Associate Editor of *QST*. His story is naturally incomplete without some appended remarks about him. Australian amateur, experimenter and journalist, Hull interrupted a trip around the world to join us in 1926. Until 1929 he was Associate Technical Editor, Director of the A.R.R.L. Technical Development Program and writer of the numerous valuable *QST* articles resulting therefrom which set our new standards in apparatus to meet "1929 conditions." Surprisingly, he managed to squeeze in time to join Mr. Handy as co-author of the fourth, fifth and sixth editions of the Handbook. Having adjusted several important immigration problems during a stay at his home in Melbourne, and in Sydney, Hull recently returned to become our Associate Editor. He is now handling special editorial problems. — EDITOR.

Ross A. Hull

F. E. Handy

that State. On graduating, he said a fond farewell to his famous 1BDI-1XAH and joined the Westinghouse Engineering School at Pittsburgh. Pittsburgh held him for about a year, but in 1925 he succumbed to the call of the League and joined up as Acting Traffic Manager during Schnell's absence in the Pacific with the Fleet. When Schnell resigned, Handy became Communications Manager and the man behind W1MK. That station, by the way, is Ed's private masterpiece. The whole caboodle was designed and most of it built by him. His title of Communications Manager tells just what he does. He is in charge of all the organized activities of our stations on the air — all that that implies. It is a man-size job.

Handy's assistant in the work of running the Communications Department is Everett L. Battey, who spends all of his time buried in divisional reports, traffic summaries, certificates and bulletins. Battey first made noises in the ether in 1925 with a station 1UE which afterwards became one of the crack traffic-handling stations in these parts. One-time Route Manager for Eastern Massachusetts and, later, Section Communications Manager for the same area, Battey has always been a traffic hound. Joining the League early in 1929 he fitted up the old 1UE again — with a "W" in front of it — just to handle a bit more traffic. Battey has been active for the last four years in U.S.N.R. work. He goes in for bowling to keep his key arm in good condition and takes an interest in collecting photographs of amateur stations. But his hobby is amateur radio.

E. L. Battey

R. B. Parmenter

A brasspounder by birth and a pounder of brass by inclination is Robert Parmenter, operator *de luxe* of W1MK. His is the fist that keeps the League Headquarters' station on the air for seven hours or more nightly. Robert is yet another of the fellows who crashed into the air with a half-kilowatt spark back in 1920. 9LX, he was, in Knoxville, Ill. In 1921, graduating from the Dodge Institute, Parmenter went to "see" with the call KUTZ of the S.S. Rochester. After a year of ploughing back and forth across the Atlantic, he came to earth at Louisville, Kentucky. He was soon on the air again with the call 9WR — a call that made a name for itself in the years which followed. Early in 1928 "Robot" came out of the South to take over the new 1MK at Brainard Field. Bob has a hobby, of course: brasspounding. He has work to do: operating and maintaining W1MK. If all the messages he has handled at W1MK were placed end to end, they would not reach far enough, according to him. During most of the day, Parmenter pounds screwdrivers, hack-saw and milliammeters in the Laboratory. During most of the night he pounds the W1MK "bug;" the "YF" gets a look at him between times.

We discovered a bunch of coils and condensers in Bob's "Lizzie" the other day. Seems he had planned a new station at his home. "Awwh," was his explanation, "a fellow wants to do some operating once in a while."

But the brunt of all the routine work of the Communications Department falls on the fair shoulders of Miss Lillian M. Salter. Not only does she take the heavy dictation of that department, but she takes care of all the details of bulletins, files and records in the Communications office. And if you ever examined the card and mailing stencil files for the thousands of ORS, RM, SCM, OO and OBS you would understand what that means. Then there's the copying of all monthly reports and the other "copy" for the Communications Department in *QST*. The "LMS" on all those letters and bulletins is hers. A hobby? Yes sir. Lillian takes a keen interest in music and plays the piano.

Lillian M. Salter

THE FINANCIAL DEPARTMENT

A. A. Hebert is the man of many jobs. He must be so well known because of his activities as League Fieldman that there is really little need to say much here. Primarily, of course, "Hebie" is Treasurer, the man behind the wherewithal, a League Officer. Then, on Warner's staff, he supervises credits and collections; also he is office manager and as such supervises the activities of the stenographers and clerks and makes quite certain that the office routine proceeds smoothly. As Fieldman, under the direction of the Executive Committee, Hebert is the traveling representative of Headquarters for aiding clubs, attending conventions and keeping in close contact with the world of amateurs. It's a bit complex but it works perfectly.

A. A. Hebert

Mr. Hebert is one of the original "hams." He has been a member of the A.R.R.L. Board since its national organization and was the League's original manager and vice-president. At the moment, he is putting in a new push-pull transmitter for his station. Judging from the preliminary lay-out, it is to be a rip-snorter.

There's a whole lot more to the financial department than OM Hebert. Firstly, there is Miss Alice V. Scanlan — keeper of the strong-box, accountant and cashier. She it is who deals out the weekly stint to all the office force. All day long, when she isn't rushing off to the bank or unscrambling invoices, she juggles with a couple of dozen enormous books, making entries in them. It's figures, figures and more figures. Though she has been at Headquarters for two years, none of us know much about Miss Scanlan. It must suffice to mention that her interests include literature and music; that her hobby is social service.

So far, we have not persuaded her to take any active interest in amateur radio. She's afraid she would be balancing her books in watts instead of dollars if that ever happened.

Alice V. Scanlan

And then there is Miss Mary A. Curley, also of the Boodle Department. She, as it happens, is positively the most recent acquisition at Headquarters, having arrived just in time to scrape into this story by the merest margin. Mary looks after the cash receipts and does the letters for her department. In addition she runs the Book Department — the handling of orders for "Amateur's Bookshelf" text-books. So busy has she been in exploring the details of her new work that it has been impossible to find out much about her. But she arrived recently from Baltimore; is enthusiastic about a life in the great outdoors; plays tennis and swims during the summer; skates and dances in the winter.

Mary A. Curley

As Office Manager, Mr. Hebert has under his wing Vernon Chambers, Office Boy. When it comes to pure unadulterated toil, we guess that Vernon can show us all a few points. Vernon doesn't shoot craps most of the day like the conventional office boy. He works. And when he isn't working he is streaking from one place to another to start something else. Making the "daily file," with its carbon copies of all outgoing letters of the previous day is his first work of the morning. The day, from then on, is occupied in delivering mail to all offices, sorting carbon copies of all correspondence for the Directors, supplying everybody with stationery and office supplies, filing letters, circulating other magazines throughout the office, grinding out mimeographed circulars and bulletins, mailing all our outgoing correspondence, dashing down-town on a half dozen errands almost every day — yes, Vernon has some work to do and does it. We're not supposed to let out the secret, but Vernon has been working hard for some time now building a "shack" up in the attic of his home and fitting it out with all the gadgets for a ham station. Already, the receiver is built and it won't be long before the license, in all its glory, hangs on the wall.

C. V. Chambers

THE CIRCULATION DEPARTMENT

Emperor of the Northeast Corner of the offices, Circulation Manager of *QST* and chief of the department which handles all the "A.R.R.L. Supplies" is David H. Houghton. His is one of the four physiognomies which contributed something to the beauty of the original story about the A.R.R.L. as well as this one. A Washingtonian by birth and an intellectual by inclination, Dave is the big "result" man of the office. The control of *QST*'s world-wide circulation is in his hands, as is the distribution of several thousand Handbooks monthly. By special dispensation, Dave has glass walls around his private office, to facilitate the keeping of a weather eye on his group of stenographers and clerks, with their involved records of members and subscribers, expirations and changes of address. It was 'way back in 1922 when Houghton joined the Crew on his way from the General Electric at Lynn to bigger things. He has a home, a wife and three delightful children. Golf is his forte; poker his weakness; editing the *American Mercury* his hobby. H. L. Mencken would be beside himself with delight could he but see Dave's "Lousy" scrawled across one of his editorials.

D. H. Houghton

Houghton's assistant in running the Circulation department is Ralph T. Beaudin. Ralph has charge of a thousand and one details involved in the mailing of miscellaneous supplies, booklets and Handbooks. Many full-sized mail bags chocked to the rim leave the department every day and Ralph has had a whole lot to do with most of them. He knows our mailing inside out, for in bygone days he used to do it all himself. Environment proving too much for him, he became a ham about a year ago, rejoicing in the call W1BAW. His first transmitter, as it happens, was used to illustrate the story on a single-control transmitter in the December 1929 *QST*.

R. T. Beaudin

Cecilia L. Christensen

Should you be a new ham writing for League membership for the first time, your application would be routed through the office to Miss Cecilia L. Christensen. She handles all the "new subs," arranging all the necessary records and making out the membership certificates. In addition, she whacks out Houghton's dictation — scores of letters a day to individuals and new agencies all over the world. Cecilia says she has no steady hobbies (except one that's tall and dark and handsome) though she is enthusiastic at the moment about dancing. This summer she plans to take to the water and what she needs most of all is a swimming instructor. Any offers?

Renewals of expiring memberships are in the hands of Miss Ellen A. Smart. Billings from the Circulation Department and a host of details associated with Handbook distribution keep Ellen on the hop continuously. Ellen's chief side-interest in life is looking forward to another trip to Europe. Already she has made two trips with her family, visiting Sweden, Holland, France, England and Germany. They were the Times of her Life. She has lots of tales to tell of the places she has seen, the people she has met and the things she has done. Ordinarily, however, Ellen is very quiet and it is not often that she can be persuaded to tell of her experiences. In between trips Ellen has a dog. It is an Airedale, the finest Airedale that ever flapped an ear.

Ellen A. Smart

Mrs. Margaret S. Evans is the third member of the Circulation Department beauty parade. If she had a title it would be Filing Clerk *de luxe*. Margaret's particular interests are membership records and mailing lists. She stacks and

Margaret Evans

unstacks row after row of membership address stencils and at busy seasons sometimes works until late at night. Just a few days ago, the Circulation Department acquired its new and very wonderful automatic self-feeding and self-imprint addressing machine that performs a half-dozen functions simultaneously. Margaret has had a big task mastering its intricacies. So that she can forget her responsibilities once in a while, Margaret takes quite an interest in collecting stamps and coins and in cutwork (some dizzy form of embroidery, she says).

Then there is Miss Bernice Lally. Really a member of the Circulation Department, Dave Houghton has loaned her to the front part of the building in the rôle of Queen of the Entrance Lobby. From behind her expansive desk in the Lobby she greets all who enter and directs them. Visiting amateurs in doubt as to whether they are welcome or not soon recognise her particular ability to settle the matter in short time. But she has her typewriter, her telephone, her files and everything else along with her and hammers away all day at Circulation Department letters. Should the visitor find it necessary to wait, Miss Lally, busy though she may be, would be guaranteed to provide full compensation.

Bernice F. Lally

QST, of course, is not actually mailed from Headquarters. To save dual handling and unnecessary delay, the copies are shot into the mails at Concord, N. H., hot from the presses. But there is a lot of mail handled from LaSalle Road just the same. All the heavy work of preparing Handbooks, miscellaneous supplies and back numbers of *QST* for the mail falls to the lot of Arthur L. Kelly. Arthur has a big mailing bench, an enormous weighing gadget and tables of postage rates for all parts of the world. Mailing a thousand Handbooks is not much more of a problem to Arthur than the posting of a single letter is to us. His ambition is to become an aviator.

A. L. Kelly

THE EDITORIAL DEPARTMENT

James J. Lamb, Technical Editor of *QST*, is the big shot, technically, around the office. His responsibility, of course, is to see that there is an ample supply of the right sort of technical contributions for *QST;* to edit them for publication; to supervise the activities of the Standard Frequency System; and to look after the A.R.R.L. Laboratory, the frequency standard and all the experimental work which goes on around the place. Jimmie came out of the Wild West — that is, if North Dakota is considered wild or western. A couple of looks at Dr. A. Hoyt Taylor, experimenting with an enormous spark transmitter at the State University long before the war, started James off on the wrong foot by awakening in him an interest in wireless. He has not been quite the same since then.

Armed with a university degree in electrical engineering, "Two-Gun Lamb" went back into the West in 1922 to put in a station 9CEI, which later attained fame in the field of 20-meter DX. For five years this station was on the air consistently with all the weird antenna, circuits, and gadgets imaginable. In 1928, becoming restless, James moved to Washington, D. C., to continue his studies. Here he put in a new station, 3CEI. It lived just one week; for Lamb was invited to join the League at the Information Service Desk. All the gadgets came along too, to become 1CEI. By 1929 James had progressed to the Assistant Technical Editor's Desk, and soon afterwards he took over the technical editorship.

James J. Lamb

Assistant Technical Editor George Grammer usually is to be found tangled in the wiring of some new transmitter, frequency meter or receiver in the Laboratory. Once a month, for a week or two, he comes down to earth to write "copy" for *QST*. In between times, of course, he handles an immense amount of correspondence on technical matters and looks after the "Station Description" and "Correspondence" departments of the magazine. George, like the rest of them, had a spark station in 1920 and an interest in the game which extended back to 1914. In 1923 the transmitter became one of those spark-coil-c.w. outfits and George has not forgotten that he worked six districts with it under the call 3AIH. Inspired by this success he put in a real tube outfit and worked the world until 1927. At this point it looked as if George was not to be an amateur any more. He married. The "YF," however, knew what it was all about and amateur activity around the house was accelerated. In 1929 Grammer came to Hartford to take over the old Information Service Desk, acquired the call W1DF, and soon thereafter became our A.T.E.

George Grammer

If it were not for Clark C. Rodimon there just wouldn't be any *QST* in the mail each month. As Managing Editor, Rodimon chases around the office with a big billy to see that the right people turn in the right amount of the right sort of copy at the right time. From the piles of material Roddy scoops off the cream, performs a final editing and shoots it off to the printer. Simultaneously, the photographs and drawings are under preparation. Later, with hundreds of yards of corrected proofs, they are made into a scrap book and shipped to the Rumford Press at Concord, New Hampshire, where the magazine is actually built. Rodimon handles the whole business and if there's a hitch anywhere it is his funeral. In 1922 he built his first transmitter, 1BIZ at Florence, Mass., and he has been on the air just about every day since then. With an 861 propped up behind the panel of his present station, W1SZ, he works the world. During the last few years, there have been few contests in which W1SZ has not taken a prominent part.

Clark C. Rodimon

C. J. Houldson

The master of the Information Service and dictator of more than 1,000 letters of advice and suggestion monthly is Clyde J. Houldson, the mystery man of the office. So occupied has Clyde been in keeping up with the inrush of letters and so retiring is he that no one knows anything about him. Putting him through the "third degree" we disclosed that his first station, rigged in 1920 at Mt. Carmel, Ill., was 9DQB; that he built and operated a 50-watt tube transmitter at Berwyn, Ill., under the call 9EDM from 1925 to 1927 while he attended Martin College; that 1AKW was his call at Springfield, Mass., while he was with Westinghouse; that from Westinghouse he came directly to *QST*. At this point Houldson shut up like a clam with an explosive "Aw, they don't want to know anything about me." So what can I do about it?

Catherine J. Craig

And now, folks, we have with us, all the way from California, Miss Catherine J. Craig — the CJC under all those information service letters and the epistles dictated by the Technical Department at large. She is a recent arrival at the office and has had some heavy headwork unscrambling the "sinusoidals," the "impedances" and the "neutralizings" from technical dictaphone records. And if you ever listened to one of Jimmie Lamb's records you can understand what work that must be when you're not a ham from the top down. Catherine has only just come across from the State of oranges and movie actresses but we know she is going to like the East.

THE ADVERTISING DEPARTMENT

For the past several years *QST* has boasted a New York office too. There, at 55 West 42nd Street, in the center of things advertising, is the office of G. Donald Meserve, *QST*'s Advertising Manager, in charge of soliciting and getting the advertising for our magazine and our Handbook.

Meserve joined the League in 1928 as Assistant Advertising Manager before the establishment of a New York office. And on the opening of that office at the end of the year he left this fair town for the city of superlatives. He comes to Hartford periodically, of course. Though he is the Advertising Manager, Meserve is a ham — and has been one since the dark ages. He first became interested in the game in 1921 and was introduced to amateur radio through 1CNA and 1AFC. From 1925 to 1928 under the call W1FL Don made a great many big noises. He had quite a hand in the Vermont Flood relief work of 1927 and in the contacts with WNP during 1927-28. At about this time he clicked off a commercial ticket chiefly to provide wall decoration we imagine. The calls he has held include 1ADF, W1BMM, W2JR and W1FL. It is under the last-mentioned that he operates his present station at Noroton Heights, Conn. Don is a 1st Lieutenant in the Cavalry-Reserve, plays polo and swings quite a bag of sticks at golf.

G. D. Meserve

Miss Ursula M. Chamberlain, Assistant Advertising Manager, height 5 feet 6¾, weight 119, swings the advertising end at West Hartford with a big stick. Ursula sees that *QST*'s advertisers get their money's worth and like it. She sits in state in an office all her own, juggling proofs and trying with all her 119 pounds to convince her correspondents that she's hard-boiled. That she has some success is evidenced by the fact that she is variously addressed from time to time as "Miss," "Mrs." and "Mr." She joined the league back in 1925 as assistant to the Advertising Manager, but many water has flown under much bridges since then. Now she handles the production and billing of all *QST* and Handbook advertising and reigns in queenly dignity over the Ham-Ad pages.

Ursula M. Chamberlain

We're planning an early trip to New York to meet Miss Marie D. Englert, Meserve's stenographer in the New York office. We are determined to see where the cheery "Good morning — *QST!*" comes from when we telephone the New York Office. In the meantime we can only present her picture (which, by the way, is quite a presentation — yes?) and explain that she is a New Yorker all the way through, having lived in Flatbush since the beginning.

Well, that's A.R.R.L. Headquarters — at least, it is one version based on intermittent observation extending over the last four years. In 1926, arriving fresh from Australia, I had the impression that to these people at Hartford there seemed to be nothing more pleasant than working for the League and producing *QST;* nothing more absorbing, nothing more entertaining, yet nothing more desperately serious. Returning a few months ago, I find it still the same.

Marie Englert

By the way, the latch-string is always out at 38 LaSalle Road!

Strays

Ever hear of a brass-pounder that did his stuff with so much vim and vigor that the key busted? Ev Battey did just that at W1MK not long ago.

— - - -

W9BAN used a wire coat hanger as a French curve when drawing the calibration curves for his frequency meter. The wire can be bent to fit the points without destroying the smoothness.

— - - -

W8BON remarks that a QSL card is the only kind of post card that can be sent through the mail and retain its privacy. We might add that even the ham on the receiving end sometimes finds QSL's undecipherable.

A Push-Pull A.C. Receiver Using Screen-Grid Tubes

A Set for the Amateur with a Push-Pull Complex

By J. S. Cebik*

THE advantages of using push-pull in trans- [illegible] and audio amplifiers have been [illegible] numerous times in the pages of [illegible] s been very little about push- Visualizing the possibilities of this circuit, considerable time and effort was spen[illegible] n designing and building a receiver incorpo[illegible]ating push-pull to the best advantage.

In the screen-grid tube the capacity between the grid and plate is reduced by the introduction of the screen grid. Reducing this capacity gives us a more stable amplifier, but the screen grid does not materially change the input capacity, that is the grid to filament capacity, while the plate to filament capacity is considerably increased. Fig. 1 shows a single-tube circuit with the various capacities noted. C_1 is the tuning condenser, C_{gsg} is the grid to screen-grid capacity; C_{sgp} is the screen-grid to plate capacity; C_{pf} is the plate to filament capacity; and C_{gf} is the grid to filament capacity. R_1 is the tube input resistance. Fig. 2 shows the equivalent push-pull circuit.

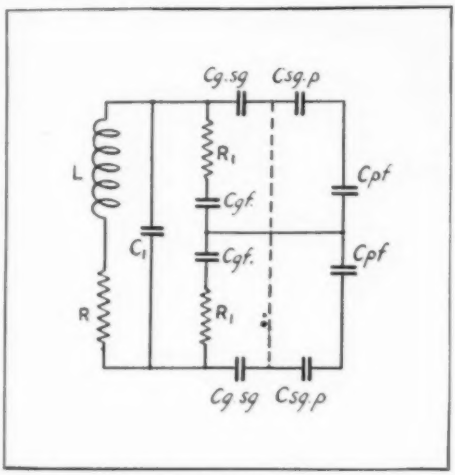
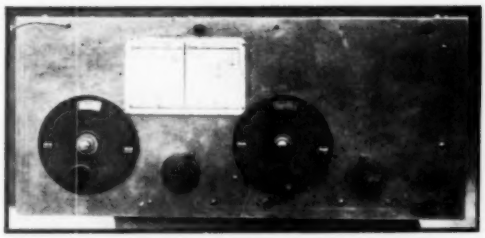


FIG. 1. — THE EQUIVALENT CIRCUIT OF A SCREEN-GRID TUBE

Since the screen grid is at cathode potential under operating conditions, the direct inter-electrode capacities principally effective are C_{gf} and C_{sgp}. The direct capacities between the plate and filament and between the grid and screen grid are relatively small.

*238 Reef Road, Fairfield, Conn.

It will be seen from Fig. 2 that in the push-pull circuit the tube capacities are in series, thereby reducing the effective tube capacities to about one-half those of the single-tube circuit. Reducing the input capacity allows the use of more inductance for a given frequency, thereby increasing the signal voltage impressed on the grids of the tubes.



THIS RECEIVER HAS A STAGE OF PUSH-PULL SCREEN-GRID TUNED R.F., A PUSH-PULL SCREEN-GRID DETECTOR, AND A STAGE OF RESISTANCE-COUPLED AUDIO

The controls on the panel are, from left to right, r.f. tuning, r.f. shunt tuning, detector tuning, detector shunt tuning, and regeneration. The "on-off" switch is at the lower right.

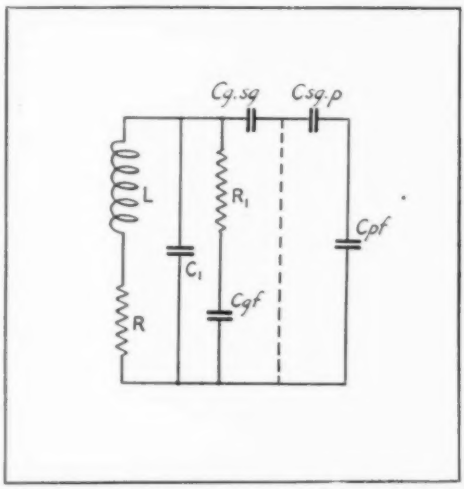


FIG. 2. — THE EQUIVALENT CIRCUIT FOR TWO SCREEN-GRID TUBES IN PUSH-PULL

The principal capacities are effectively in series across the input and output circuits.

It should also be noted that the tube resistances are in series, thereby doubling the input resist-

ance and very materially increasing the input impedance. The use of more inductance for a given frequency also gives the advantage of better coupling to the tickler which in turn gives a much smoother control of oscillation on the higher frequencies than is possible with a single-tube circuit.

The receiver described in this article is similar to that described by the writer in the Experimenters' Section, August 1930 *QST*, but with the addition of a stage of tuned radio frequency in push-pull.

CONSTRUCTION

The set is built on an aluminum panel 18" x 8" x 1/8" thick with a sheet of 16-gauge aluminum isolating the r.f. stage from the detector circuit. The set is fitted into an aluminum cabinet 8 inches deep and made of 16-gauge stock.

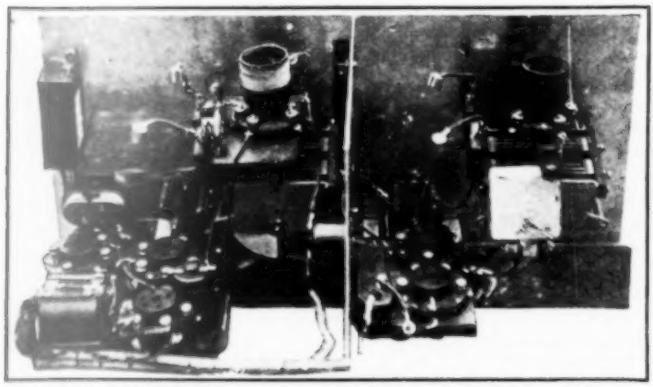
The tuning condensers are the Cardwell double-spaced type. The stator is sawed in half making a condenser of two stators with a common rotor. The use of this arrangement in place of using a regular condenser and center tapping the tuning inductance is preferable because this arrangement does not necessitate the matching of tubes for identical inter-element capacities, since the circuit finds its own electrical center. Three stator and three rotor plates are used to each section, making a total of twelve plates to the condenser, but it must be remembered that the two sections are in series, reducing the total capacity in the circuit approximately to that of a three plate condenser. The arrangement of plates is shown in Fig. 4. A 23-plate midget condenser is shunted across the inductance to increase the tuning range and still keep the band-spreading feature.

A small sub-panel is mounted over each condenser to take the sockets for the plug in coils. This arrangement shortens the control-grid leads to a practical minimum. It will be noted that the detector grid-leak clips are also mounted on this base. The plate choke for the r.f. stage is mounted on the shield isolating the two circuits, while the detector choke is mounted between the two sockets and next to the tuning condenser. The r.f. screen-grid choke is mounted in back of the two sockets in this stage. The detector screen-grid choke was found to have very little effect and is not necessary.

All the low-frequency wiring is shielded in lead cabling and grounded as a matter of extra precaution.

Grid bias is obtained by using a resistor between the cathode and ground in the radio-frequency stage while grid-leak bias is used in both the detector and audio-frequency stage. While this is more or less a departure from the method used in most of the a.c. receivers described in *QST*, it was found that no advantage was secured by using a battery for bias.

There is still another departure in using resistance control of regeneration in the detector plate circuit when



THE COMPONENTS ARE SUPPORTED BY THE PANEL

The r.f. stage is at the right with a baffle-shield between it and the detector-audio compartment at the left. The coil sockets are fastened to bakelite strips mounted on the tuning condensers. Details of the construction are given in the text.

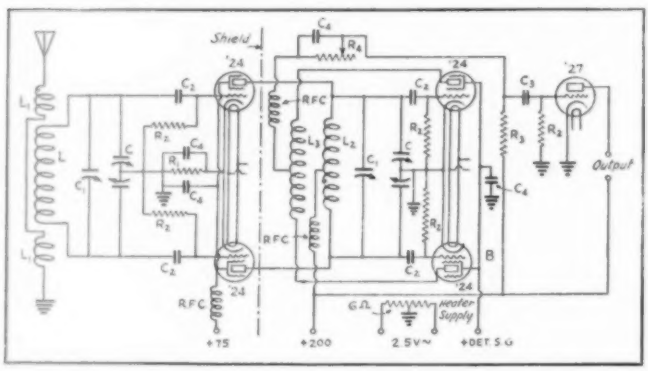


FIG. 3. — SCHEMATIC CIRCUIT OF THE PUSH-PULL RECEIVER

***L*, L_1, L_2, L_3 — See Fig. 5.**
***C* — Split-stator tuning condenser. See text.**
C_1 — Shunt tuning condensers, 23-plate midget type.
C_2 — 100-μμfd. grid condensers.
C_3 — .006-μfd. coupling condenser.
C_4 — 1-μfd. by-pass condensers.
R_1 — 400-ohm bias resistor.
R_2 — 1-megohm grid leaks.
R_3 — 250,000-ohm plate resistor.
R_4 — Regeneration control, 25,000- to 250,000-ohm variable resistor.
RFC — Radio-frequency chokes.
The heater connections are omitted for the sake of simplicity. The "grounds" indicate connections to the shielding.

using a resistance coupled audio amplifier. Regeneration control was first tried in the screen-grid lead, but it was found that the voltage here was extremely critical, in fact so critical that the set would not oscillate at all if the voltage was not correct. The resistance control in the plate circuit worked out beautifully; in fact it works the same as when using it in the plate circuit of a three-element tube with transformer coupled audio. The resistance is a Bradley-ohm No. 25 (25,000 to 250,000 ohms) and is shunted by a 1-μfd. condenser which eliminates all noises due to the resistance adjustment.

Care should be exercised in mounting the shunt tuning condensers and the oscillation control resistance to keep them from being grounded to the panel. The method used was to mount these units on strips of insulation, over-size holes being bored where the shafts project through the front of the panel. A voltage of 200 is used on the plates of the radio- and audio-frequency amplifiers and the same voltage is used on the detector, the plate resistance dropping the actual plate voltage on the latter to about 60. The r.f. stage screen-grid voltage is 75, but this voltage is not critical. While this receiver has not been tried on frequencies higher than 16 mc., there is no reason why it should not function satisfactorily on frequencies as high as 40 and 50 mc. In building a receiver for these frequencies the midget shunt tuning capacities should be eliminated, and it may be advantageous to couple the r.f. stage to the detector through a pair of small condensers inserted between the plates of the r.f. tubes and the detector grid circuit. These condensers should be of the midget type with a maximum of 50 $\mu\mu$fd. and should be adjusted to the point where there is the least interaction between the two circuits. Once these condensers are set it is a good plan to leave them alone since readjusting them affects the calibration of the receiver. This arrangement necessitates shunt d.c. plate feed. Fig. 5 shows these modifications for ultra-high frequencies.

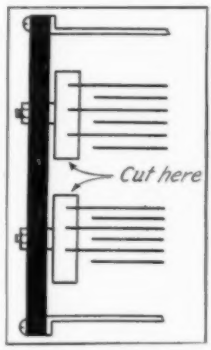


FIG. 4. — THE TUNING CONDENSERS ARE OF THE SPLIT-STATOR TYPE

They can be made from a single-stator condenser by cutting a section from the stator support as shown above.

THE INDUCTANCES

The tuning inductances used in the receiver are wound on bakelite tube bases, and it has been found that there is very little difference in the results obtained as far as the size of wire used on the coils is concerned. The specifications of the tuning inductances may not work out in all cases, because a variation in the spacing of the parts and differences in the wiring may necessitate slight changes.

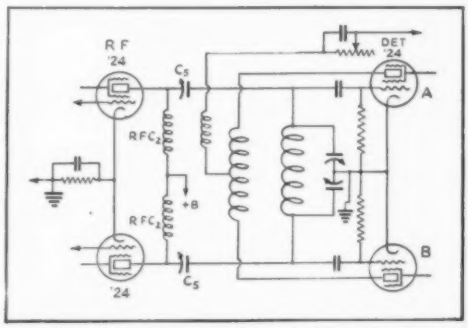


FIG. 5. — SMALL COUPLING CONDENSERS ARE SUGGESTED FOR ULTRA-HIGH FREQUENCIES

The coupling condensers, C_5, may be small midget variables. Shunt plate feed through radio-frequency chokes will be necessary.

The tickler coils are considerably larger than those used in the single-tube circuits. It is recommended in winding the tickler coils to add a few extra turns. It will be noted with an over-size tickler that the set will oscillate only on the low-frequency end of the tuning range and that removal of the proper number of turns will give oscillation over the whole scale of both the main tuning and shunt tuning condenser. If trouble is had in making the set oscillate, the tickler may be moved closer to the inductance; and if this does not bring the desired results, moving the tickler further away may help. This spacing has been found to be fairly critical and may vary from no

(*Continued on page 89*)

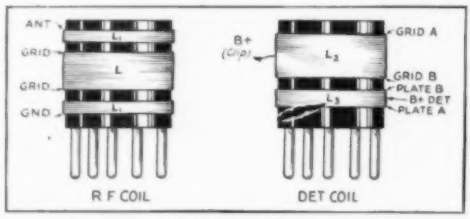


FIG. 6. — THE COILS ARE WOUND ON TUBE-BASE FORMS

L_1 is wound in two sections, one on either side of L. All coil terminals connect to prongs except the B+ terminal of L_2, which connects to a clip. With both windings on the detector form in the same direction, the grid and plate connections to tubes A and B should be as shown in the above sketch.

Coil Data

Band	No. Turns			
	L	L_1	L_2	L_3
3.5 mc.	26	17	28	52
7.0 mc.	14	14	14	40
14 mc.	8	12	7	32

All coils are wound with No. 26 d.s.c. except L_3, which is wound with No. 36 enameled. If a plate voltage higher than that specified should be used on the detector, fewer tickler turns will be required.

Standard Frequency News and Schedules

BECAUSE we are crowded for space in this issue of *QST*, the s. f. write-up must be shorter than usual. Here are the schedules for April and May. Let's use them.

DATES OF TRANSMISSION

Apr. 3, Friday	C	W6XK
Apr. 5, Sunday	C	W1XP
Apr. 10, Friday	A	W1XP
	B	W9XAN
	B	W6XK
Apr. 17, Friday	BB	W1XP
	B	W9XAN
	A	W6XK
Apr. 18, Saturday	BX	W6XK
Apr. 19, Sunday	C	W9XAN
Apr. 24, Friday	BB	W6XK
	B	W1XP
	A	W9XAN
Apr. 26, Sunday	BB	W9XAN
	C	W6XK
May 1, Friday	C	W6XK
May 3, Sunday	C	W1XP
May 8, Friday	A	W1XP
	B	W9XAN
	B	W6XK
May 15, Friday	BB	W1XP
	B	W9XAN
	A	W6XK
May 16, Saturday	BX	W6XK
May 17, Sunday	C	W9XAN
May 22, Friday	BB	W6XK
	B	W1XP
	A	W9XAN
May 24, Sunday	BB	W9XAN
	C	W6XK
May 29, Friday	C	W6XK

STANDARD FREQUENCY SCHEDULES

Friday Evenings Schedule and Frequency			*Friday and Sunday Afternoons Schedule and Frequency*		
Time (p.m.)	*A*	*B*	*Time (p.m.)*	*BB*	*C*
	kc.	*kc.*		*kc.*	*kc.*
8:00	3500	7000	4:00	7000	14,000
8:08	3550	7100	4:08	7100	14,100
8:16	3600	7200	4:16	7200	14,200
8:24	3700	7300	4:24	7300	14,300
8:32	3800		4:32		14,400
8:40	3900				
8:48	4000				

Saturday Morning Schedule and Frequency	
Time (a.m.)	*BX*
	kc.
4:00	7000
4:08	7100
4:16	7200
4:24	7300

The time specified in the schedules is *local standard time at the transmitting station*. W1XP uses Eastern Standard Time, W9XAN, Central Standard Time, and W6XK, Pacific Standard Time. Schedule BB transmitted by W1XP is intended particularly for European amateurs and starts at 2100 G.C.T. Schedule BX is transmitted especially for amateurs in Oceania and the Far East. It is transmitted starting at 1200 G.C.T. by W6XK. Reports on these special schedules are particularly desired, not only from overseas hams but from those in the Americas also.

TRANSMITTING PROCEDURE

The time allotted to each transmission is 8 minutes, divided as follows:

2 minutes — QST QST QST de (station call letters).

3 minutes — Characteristic letter of station frequency by call letters and statement of frequency. Characteristic letter of W1XP is "G," of W9XAN is "D," and of W6XK is "F."

1 minute — Statement of frequency in kilocycles and announcement of next frequency.

2 minutes — Time allowed to change to next frequency.

THE TRANSMITTING STATIONS

W1XP: Massachusetts Institute of Technology, Round Hill Research, South Dartmouth, Mass., Howard A. Chinn in charge.

W9XAN: Elgin Observatory, Elgin National Watch Company, Elgin, Ill., Frank D. Urie in charge.

W6XK: Don Lee Broadcasting System, Los Angeles, Calif., Harold Peery in charge.

REPORTS

Handy blanks for recording and reporting the transmissions can be had for the asking. Just drop a card or send a message to Hq. asking for s.f. report blanks and they will be sent postpaid. When you receive a transmission be sure to send in a report addressed to the A.R.R.L. Standard Frequency System, *QST*, West Hartford, Conn. After a record of the report has been made at this office it will be forwarded to the proper transmitting station.

5000-KC. BUREAU OF STANDARDS SIGNALS

Standard frequency signals of 5000-kc. frequency, accurate to a few parts in a million, will be transmitted by the Bureau of Standards Station, WWV, on the following Tuesdays: April 7th, 14th, and 28th; May 5th, 12th, and 26th. The transmissions will occupy two-hour periods during the afternoon and evening of each of the above dates, the hours being from 1:30 to 3:30 p.m. and from 8:00 to 10:00 p.m., E.S.T. More complete details of this service will be found on page 39 of January *QST*. These signals are particularly useful for calibrating piezo sub-standards, etc. Reports on WWV transmissions may be forwarded to the Bureau of Standards direct or via A.R.R.L., West Hartford, Conn.

— *J. J. L.*

EXPERIMENTERS' SECTION

Keying the M.O.P.A.

By Burr Jamison, W4LM*

HAVING read the article on the oscillator-amplifier transmitter in February *QST*, I should like to make a few remarks about the subject. I have done a great deal of work with the oscillator-amplifier circuit, although my experience has been mostly along the lines of crystal control.

The choice of keying may be detrimental to the character of the signals emitted. It is possibly inadvisable to key in the center tap of the amplifier following the oscillator. No matter what the plate voltage on the power amplifier is, there is always grid current flowing in the grid circuit of

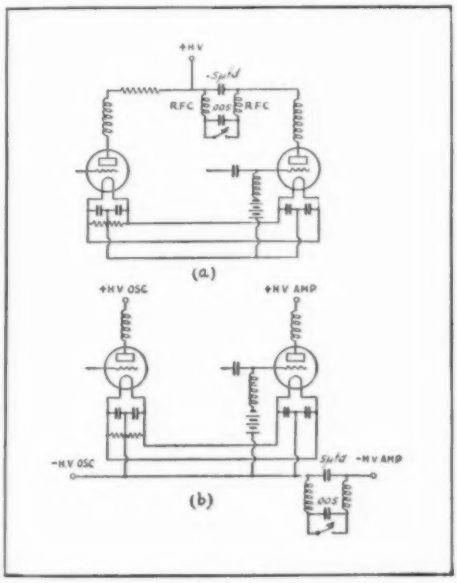


FIG. 1

the amplifier when its grid is receiving excitation, even with no plate voltage whatsoever. This grid current does not vary greatly for different plate voltages, but does increase slightly with the application of lower plate voltages. Therefore, when we light the filament of our amplifier tube, and close the grid circuit, we are taking power from the oscillator, no matter what plate voltage we have on the amplifier. When we key in the center tap we are opening and closing the grid circuit, thus alternately taking off and putting on the oscillator load. The importance of this is apparent when it is realized that throwing the load on and off is more than likely to cause a frequency change in the oscillator. Also, if we are using a resistance in the plate circuit of the master oscillator, and in every oscillator the plate current increases when load is being drawn from it, the voltage drop across the resistor will be greater when the amplifier is keyed in the center tap, and the voltage applied to the oscillator will be less, resulting in a frequency change. Since the amplifier is keyed in this manner, a frequency fluctuation in the oscillator will occur the moment the key is closed or opened.[1] Therefore the two-tube m.o.p.a. transmitter should preferably be keyed elsewhere than in the center tap of the power amplifier, if oscillator frequency changes with keying are to be avoided.

In the aforementioned article I also noticed the statement that when keying in the plate circuit of the amplifier, the key thumps resulting would be harder to eliminate than with center-tap keying. However, I have found that if one connects a .005 μfd. fixed condenser across the key, and two r.f. chokes of about 200 turns each in each key lead, the sparking across the key and the thump are materially reduced — enough to satisfy many BCL's.

Then we may key our m.o.p.a. in the plate circuit of the amplifier. Two keying diagrams are shown in Fig. 1. That at (a) may be used when the oscillator and amplifier are both fed from the same plate supply. Since the key is in the positive lead a keying relay should be used. At (b), which may be used when separate plate supplies are available for both oscillator and amplifier, the key is in the negative lead of the high-voltage supply for the amplifier, and there is little danger of shocks when using the key directly.

In connection with neutralization, I find that the ½-watt 110-volt variety of neon lamp is superior to small flashlight bulbs and is cheaper, because there is no danger of blowing it out. The neon lamp is also more sensitive than the ordinary flashlight bulb, and need only be held

(*Continued on page 62*)

*2005 N. 16th Ave., Birmingham, Ala.

[1] Such a frequency fluctuation is likely to occur with any form of keying if the oscillator and amplifier are both supplied plate voltage from the same source, because of voltage changes when the load is thrown on and off the power supply. A High-C oscillator can stand comparatively large plate voltage changes without much change in frequency, however. — Ed.

• I. A. R. U. NEWS •

Devoted to the interests and activities of the

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New Zealand Association of Radio Transmitters
Norwegian Radio Relay League
Radio Society of Great Britain
Rede dos Emissores Portugueses
Reseau Belge
Reseau Emetteurs Français
South African Radio Relay League
Sveriges Sandareamatorer
Union Schweiz Kurzwellen Amateure
Wireless Institute of Australia
Wireless Society of Ireland

Conducted by Clinton B. DeSoto

MANY amateurs who have never before had opportunity to perform the heroic service associated with amateur aid in case of emergency and disaster, participated in the tragic detail of relief and communication work encountered in the New Zealand earthquake, which began February 2, 1931, at 2100 G.C.T. Many people other than amateurs obtained their first glimpse of the "behind-the-scenes" work of amateurs, and had their first taste of their value. The whole story is told graphically in the following paragraphs by the Section Communications Manager of the A.R.R.L. East Bay (California) Section.

— - - - —

Reporting the New Zealand Earthquake

By J. Walter Frates, W6CZR

"The Radio Ham wears the Seven League Boots. . . . That thrilled us in fairyland lore. . . . He strides o'er the air lanes and garners the fruits. . . . From many a radio shore. . . . He sits with his hand on the pulse of the world. . . . He harks to her myriad voices. . . . He traces her dramas as they are unfurled. . . . He hears when she weeps or rejoices. . . . He stretches his arm 'round old Mother Earth's waist. . . . And says, 'This is cozy, my dear! . . . And if you are keeping a secret, make haste. . . . And whisper the same in my ear!' . . . He captures wild words on their pinions of sound. . . . From Boston or Nome or Siam. . . . The key to the secrets of space he has found. . . . So here's to the Radio Ham!"
— Jack Burroughs in The Oakland Tribune.

With the cables of the world jammed with personal and governmental traffic that left little room for press dispatches and the western world avid for information concerning the magnitude of the recent earthquake and fire on North Island, New Zealand, amateurs on both sides of the Pacific stepped into the breach in a manner that called forth the above expression of commendation from a staff writer on a Pacific Coast American newspaper.

These amateurs, working over thousands of miles of land and ocean with little subsidiary communication channels at their disposal, provided many interesting sidelights to the main account of the disaster carried by the press wire associations, and in some communities found their own information taking precedent on the front pages because of its timeliness and human interest.

While it is true that amateurs did not secure as complete and consistent information as the wire services, and that the newspapers and the general public could have done without their volunteer aid, yet their work was highly valuable in several instances not only from the standpoint of the general public but of the amateur fraternity as well. Through their nightly contacts with Australian and New Zealand stations, Pacific Coast amateurs were able to furnish comprehensive figures on the extent of the disaster, the number of persons affected, whether or not the quake had been felt in other portions of New Zealand and Australia, the extent of the rescue work, how the catastrophe had affected a few individuals and sections of both Napier and Hastings, whether or not New Zealand amateurs were in the area, and the extent of the communication work being done by both Australian and New Zealand amateur stations. In addition,

(*Continued on page 74*)

• CALLS HEARD •

W2LG, William H. Bauer, 299 Etna St., Brooklyn, N. Y.

7000-kc. band

cm1by cm1oe cm2fn cm2jm cm2rz cm8yb cmz6 cn8mc cne ct1as ct1bg ct1bx ct1by ct1cc ct1cd ct1cp ct1cw ct1do ct1dx ct2ac ct2ad ct2ae ct2af ct2ag ct2as ctaj d4lgh d4uaj d4uap ear18 ear21 ear52 ear94 ear98 ear105 ear116 ear118 ear121 ear125 ear126 ear136 ear149 ear169 ear177 ear185 ear199 earco earz f8ad f8ank f8ay f8btr f8cs f8er f8fb f8fx f8gy f8ji f8joz f8kw f8lw f8mm f8pq f8pw f8pz f8sk f8tx f8wok f8xz fm8cfn fm8ih frear g2ao g2nl g5by g5lo g5oc g6wy he1fg hh7c i1hv k4rj lg3 lp1 nj2pa nn1nic ok1na ok2cc on4xb pa0ro pa0vt st3wt tg1as ti3xa uown v1ja ve1al ve1bl ve1bm ve1bv ve1co ve1pk ve2ab ve2aq ve2bo ve2bw ve2cl ve2ep ve2eu ve2ev ve3aj ve3aw ve3ay ve3bc ve3be ve3bq ve3cf ve3co ve3da ve3dr ve3dw ve3ec ve3fu ve3gf ve3gk ve3gt ve3ha ve3hl ve3ll ve3rf ve4bq ve4dj ve4ec ve4fn ve4hr ve4ik ve4it ve4jr ve4js ve5cr vo8aw vzx4x x1af x1n xf7c xx3bm xbaa xbaj zl4ba zv1 w6aba w6abf w6abr w6aby w6acj w6adh w6aej w6aeo w6agr w6aix w6ajj w6ajr w6aln w6alt w6am w6amm w6amy w6aod w6aoe w6aor w6ape w6aqf w6are w6ati w6auk w6avy w6awd w6awp w6awy w6axv w6ayc w6azh w6azu w6bbp w6bcd w6bck w6bco w6beq w6bet w6bfa w6bfe w6bgc w6bht w6bhx w6bkm w6bjl w6bov w6bpp w6bq w6bqh w6bqp w6bsa w6bvg w6bvx w6bxl w6by w6byb w6bzo w6bzs w6cau w6cbp w6cbr w6ced w6cel w6cen w6ceo w6ceu w6cfd w6cgp w6che w6cig w6cih w6cii w6ckt w6cle w6cob w6cox w6csp w6cuh w6cvf w6cwt w6cxw w6cya w6cyr w6czx w6dai w6dcv w6ddg w6dfb w6dhm w6dhw w6dhy w6diq w6djx w6dkc w6dmp w6dnd w6dqv w6dsp w6dtj w6dtk w6dtq w6dtz w6dui w6duj w6dxc w6dyn w6eak w6eaq w6ebo w6ebs w6ecc w6ecn w6edd w6edj w6eep w6efm w6efr w6efs w6efv w6egh w6egk w6egv w6eif w6ejh w6eju w6ekj w6ell w6emk w6erc w6esa w6etj w6etr w6eul w6ewk w6eww w6exq w6eyc w6ezd w6ezg w6ezk w6ezn w6ezp w6ezv w6fal w6fbi w6fdo w6feb w6fj w6hw w6il w6jn w6oj w6re w6sa w6sb w6se w6sn w6tm w6zzg w6zzv w6zzz w7aah w7aax w7ahn w7ame w7apv w7arz w7aty w7cp w7ds w7ek w7fa w7fv w7gj w7gm w7if w7ii w7mo w7rt w7td w7tx w7wl w7zd

W. A. W. Stevens, 75 Wilson St., Hawera, New Zealand

3500-kc. band

k6yal ve3ai ve3da ve3gk w1amq w1apk w1auy w1azh w1ach w1adw w1bxb w1bbu w1bkn w1cti w1hd w1ip w1kv w1lq w1mk w1wu w1wv w1zb w2agn w2eez w2eyp w2fr w2gj w2wk w2jf w3avi w3aex w3alq w3ac w3aff w3asg w3bbw w3bwt w3bof w3bac w3cxm w3cv w3jz w3mc w3mp w3oo w3sm w3za w4jr w4pw w4qv w5aae w5asm w6aix w6bbj w6edz w6erf w6dli w6ead w6eke w7acd w7ahv w7alw w8ane w8ahz w8aci w8afq w8aeo w8agu w8azo w8asc w8bf w8bxy w8bnu w8cmk w8ccw w8cjb w8cpl w8cdh w8crs w8dej w8dcv w8diz w8dra w8dsv w8dvw w8dtk w8deh w8gp w8hd w8he w8ih w8jh w8rd w8wf w9azy w9aid w9aeq w9bwi w9cdg w9cjq w9cfq w9dsc w9daq w9dgz w9ejx w9ewc w9eup w9eru w9fpq w9fpn w9fif w9mm w9ox w9vd

7000-kc band

ct1aa cn8rux d4abr d4rpi ac1ts ae1bd ae2ay ae2aw ae5go ae8go ae8ls ae8rv ae8cw ear52 f8ba f8er f8eq f8xz f8aap fm8eor fm8ih fm8tui fm8rit fm8fs g5aq g5by g5bz g6wy haf5c j1ll j1et j2wv j3cr j3et k4kd k4dk k4rf k6boe k6cib nj2pa on4ka on4jj ok2et ok2si oz7eh oz7t pk3bm pk3bq sgcn ti2rs ti2wd vk8xt ve1da ve2ax ve2bb ve2ac ve3et ve3ct ve3rf ve3dr ve3er ve3bk ve3dw ve4ai ve4bb ve4dj ve4gk ve5cj ve5al vo8aw vo8z vs3ab vs6af w1ajq w1aow w1asf w1bzq w1bkn w1cmp w1mk w1oa w1rv w1si w1sz w2alu w2amr w2exl w3asg w3anh w3ant w4aea w4aef w4aii w4eg w4ft w4oc w4qv w4rb w4sk w5asm w5axs w5aqy w5ahb w5acy w5ab w5bbc w5bpe w5ms w5ql w5rw w5td w5va w5yg w6dli w6djx w6eep w7acd w8aka w8bau w8cyp w8cmb w8mb w8on w8oq w8cwd w8tj w9aok w9ara w9bwt w9bcl w9bnh w9bez w9bpm w9cd w9dfy w9dr w9dqe w9eve w9eup w9fvo w9fpq w9pu w9um w9vd xw7eff x2x x9a x29a yi2gq zk1aa zs5u

14,000-kc. band

ac1bd ac3ab ac8em ce3ab ce3ch ce3cr ce7aa ce5aa ct1aa ct1cw ct2aa ct2ac ct9aa ex1af ex1an cx2bt d4xn d4yt d4irg d4sux d4abg d4cxz d4wao ee3 ear21 ear37 ear39 ear96 ear98 eu2bw eu5bh f8rj f8eo f8gdb f8pz f8alc f8nk f8cs f8xaz f8dt f8ex f8aly f8pq fm8bg fm8cr f8wb f8gyn g2ao g2vq g2cj g2kf g2vm g2xv g2ol g2lz g2od g2du g2nu g2by g2dz g2gm g2cx g2ux g5vm g5by g5bz g5ml g5oc g5yk g5is g5ms g6rb g6ut g6wy g6qb g6wt g6vp g6xq g6gs g6nf g6wn g6ik g6rh g6hp g6wr g6rg g6lk g6mt g6xb haf3b he1fg hc2jm i1au i1gl i1ll j1dq j1dr j1tw ka1cm ka1el ka1hr k6erh k6dmm lu1jm lu1dy lu1ca lu2am lu2ea lu3dh lu3de lu3fk lu4dq lu4dw lu5dee lu5dj lu8ca lu8dj lu8dy lu9dt oa4c oa4j oa4z oh7nd oh3nq oh1nf oh3na oh4nc oh7nb oh2nd oh2na oh2nm ok2rm ok2si ok2va ok2op ok2nm on4au on4fe on4ft on4ro on4ar on4uf on4ur on4mi on4hc on4cn oz1d oz2u oz5a oz5m oz7y oz7oq oz7jo oz7bl oz7z pa0qf pa0fb pa0dw pa0xf pa0an pk1cx pk1jr pk2aj pk1hr pk2fd pk3bq pk3bm pk4az pk4yy pk4bo pk4aj pk6aq py2bk sp3gb st2a un7ww uosx uowg uocx velar velap vela5 ve2ap ve2bd ve2be ve3fj ve3fs ve3xs ve3gg ve3bc ve3co ve3et ve3eb ve4cv ve5ak ve5ao vd2xy vjlql vo8aw vo8z vo8ae vo8mc vq3man vq4mla w1ahx w1ae w1apl w1aqt w1au w1bjd w1aze w1cei w1caa w1dp w1id w1ry w1wv w1zz w2ag w2afv w2arb w2aog w2ayj w2biv w2ba w2epr w2cuq w2el w2mb w2qn w2us w3anh w3arp w3acx w3atj w3oh w4aef w4agr w4fm w4qv w5arv w5ql w5rg w6awz w6biv w6dak w6ud w6yg w7aih w8adm w8bf w8ctv w8cbe w8cwo w8chc w8dld w8gz w8qb w9bwt w9dh w9dma w9dgz w9ef w9fur w9fxj w9ful w9fpj w9df w9mi x1j x1n x9a x9b xu2uu xu5wa vs3ab vs3ac vs6ag vs6ae vs7ap vs7ai vs7lv vu2ah vu2bg vu2jb st6hl su8rs su8wy yi1ac yi1cd yi1em yi1lm yl2ra zp7ab zs2n zs4m zs5w zs5u zs6y zs6d zt1r zt1t zt2b zt5r zt6x zu1d zu5b zu6n zu6s

G6YL, Miss Barbara Dunn, Felton, Northumberland, England

7000-kc. band

w1avl w1cjb w1epi w1sz w2aja w2ama w2amr w2axs w2az w2bai w2bda w2bhy w2bro w2bu w2ck w2cnr w2crb w2re w2ku w3ano w3bbb w3beo w3cjn w3nt w3ay w3ut w3zzb w4ady w4aeg w4afe w4agr w4arg w4ft w4gq w4qf w4ql w4tr w4zh w8ayh w8bjz w8lt w8pk w8rh frear149 frear153 fm8bg fm8cfr fm8cr fm8eor fm8ih fm8lc ezr56 ka1ce ka1cm ka1hr ka1jr ka1re ka1su om1tb xohsan xok1kw es3jr rx1aa ry1l ve3gf va1ab cm8yb yi6kr yl2el zc1s zl4tb lcfh spg1 xf7c xx3bmd 55k

G2JA, A. D. Stenning, Radio Operator S. S. "Rotorua." 25 Woodlands, North Harrow, Middlesex, England

7000-kc. band — Caribbean Sea

he1fg hh7g kfr6 w1mk w1vs w2chq w4aft w4aig w4ey w4lv w4tg w5acy w5afx w5ce w8bct w8dal w9aio w9cda w9eqc w9yc

(*Continued on page 68*)

• CORRESPONDENCE •

The Publishers of QST assume no responsibility for statements made herein by correspondents.

Great Work!

Editor, *QST:*

The impossible has happened. February 10, 1931, nine 'phones on 3500-50-kc. band in nine different districts hooked up in a successful round table QSO.

It all happened like this. The "XYL" operator at W5PP finished up a QSO with a nine at 2:40 a.m. and W7ANT called her. They worked a few transmissions when W3AVY broke in on W7ANT and W5PP heard him and got him lined up. Then W6FEV came in and QRM'd W7ANT and W3AVY, so W5PP called W6FEV and got him lined up. Things went all OK when W9EOD busted in with his ether buster and W5PP called him and got him lined up. Then W5PP suggested that they should get a 1, 2, 4, and an 8 lined up for an all-districts QSO party. W3AVY got busy and lined up the other four districts, W1APU, W2ACA, W4WS and W8BEX.

We believe that this is the first time all nine districts were ever lined up on either 'phone or c.w. on any band for a round table QSO. The party started at 2:45 a.m. C.S.T. And now the mad scramble for the verification cards!

— *L. F. McCollom, W5PP*

That 11-Year Cycle

566 Highland St., Helena, Mont.

Editor, *QST:*

Have just finished reading the editorial in the February issue of *QST* and, having been in the ham game since 1921, I felt that I might be able to add a little information that might be of some value.

I went on the air myself in 1922, but not until the latter part of 1923 did I start to actively engage in the c.w. end of the game with what might be called as good as an average layout. From this time until the advent of the short waves, I worked all over the U. S., all states, and had no difficulty in working both coasts at will. I was at that time located in Denver, Colo., operating 9CAA. Also, when Australia began to hear U. S. stations, I was among the first to receive their reports and did so quite frequently up until the migration to shorter waves, as they were referred to in that period. That much to show that the low-frequency band is a good band, and that it was as good for DX as our 80-meter band has been popularly reputed to be. My power ran from 25 to 175 watts input and was reported from Australia and New Zealand on both the maximum and minimum power mentioned.

When the 80-meter band came into being, I was among the very first to move down, doing so immediately after *QST* gave an account of what had been done there in an experimental way. However, I always noticed that stations got quite scarce on this band as the evening progressed until about 11:00 p.m., when practically all U. S. stations were very weak. As I glance through my old logs, I find most QSO's late in the evening were quite distant, usually on or near the east coast. The result was that as soon as quiet hours were over I usually moved back to the 160-meter band. The next winter the same condition was considerably less noticeable, comparing favorably with observations this season.

As mentioned in the editorial, I noted that DX was best in the forty-meter band around 1928 while 80 was about the same as our 160-meter band had previously been. This year and to a considerable extent last year, I notice the 7000-kc. band goes nearly dead about 8:00 p.m., M.S.T. Not only that but in the last two months I have noticed that skip distance makes its appearance about the middle of the evening on 3500 kc. I have been keeping a schedule with W9EAM in Denver on the 3500-kc. band at 10:00 p.m. each evening and practically always hear him in good shape earlier, but he has almost invariably been very much weaker at ten, and the last few weeks I have been missing him altogether quite frequently. W7AAT at Red Lodge comes through better in daylight than he does late in the evening, although usually he is FB in the early evening. The same is true of W7FL at Butte. Many nights signals have all but faded out altogether on the 3500-kc. band. Can usually hear a great many signals but all very weak, and the majority of the louder stations are east coast stations. I had at first thought that this was a freak location here at Helena, but inquiry from stations I have worked shows they are all experiencing similar evidence of changing conditions.

I hope this may be of some value. If I can give any more information or help in any way, I shall be glad to do so.

— *C. R. Stedman, W7ASQ*

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6. *Lower leakage at high voltages than any other electrolytic condenser.*
7. *Life expectancy in excess of requirements of usual radio assembly.*
8. *Compact, clean, non-spillable, efficient, inexpensive, self-healing, reliable.*

Thus the Dubilier organization brings two years of research and engineering development on electrolytic condensers to a practical conclusion. The results are available to you in meeting your condenser requirements. May we present complete details and samples?

NEW OUTPUT METER

(Constant Impedance 4,000 Ohms)

WESTON Model • 571 •

Transmitting amateurs, service men, set builders and radio experimenters will find immediate use for this new Weston model 571 OUTPUT METER. It is a portable instrument for measuring directly the output voltage of radio receivers.

It may also be used to compute power output of radio sets; to determine the maximum gain when lining up R.F. and I.F. stages or when a calibrated input voltage is applied to a radio set or to an audio amplifier; to determine the relative gain of tubes; to measure the comparative selectivity of R.F. tuners; to observe the period and percent of fading; and to approximately measure the relative fidelity of amplifiers such as used in theatres and public address systems.

Model 571 OUTPUT METER consists of a standard Weston Model 301 A.C. Voltmeter of the Rectifier type with a constant impedance of 4,000 ohms. Its five ranges, 1.5/6/15/60/150 volts, selected by means of a dial switch, are brought out to two binding posts. The instrument is enclosed in a sturdy black Bakelite case. Size: 5½ x 3⅝ x 2⅛ inches. Weight: 1 pound, 10 ounces.

WRITE FOR CIRCULAR R-R

WESTON
ELECTRICAL INSTRUMENT CORP.
602 Frelinghuysen Avenue Newark, N. J.

From an Old-Timer

Hyattville, Wyo.

Editor, *QST:*

"Old-Timers' Week!" Well, here was one old timer who combed the air on 20, 40, and 80. I contacted a lot of fellows that had been on since 1924 — some back to 1921 — but only one pre-war man. "Oh where, oh where have they gone?"

I was one of the first to put in a receiver to pick up the big arc stations. I remember writing an article for *QST* regarding my reception of POZ and other foreign stations, and I remember how Allen H. Babcock (who looks out at us from page 8 of December *QST*) wrote me regarding my reception. I convinced him I was not as big a liar as it appeared.

I started my first station in 1913, and soon after I heard of a magazine called *QST*. I sent in my subscription and got *QST* — about a dozen pages, but a real nifty little magazine. Then came the war and poor *QST* went under. After the war a lot of the old-timers bought bonds at $10 each and started up the *QST* that to-day we are all proud of.

Regarding the High-Power Holiday. It hits the mark and is one reason for this outburst. This evening from 4:50 to 5:20 p.m. I checked six stations between 6985 and 6975 kc. all with rotten r.a.c. and a.c. notes that took up 20 kc. If we had pure d.c. we could work 10 stations where one a.c. is to-day. It's a crime to stir the air with some of the junk heaps. My present station is a 1929 Hartley with a Type '10 tube and 500 volts of Edison battery, and I work 'em all. Most reports from East coast are QSA5 on 20, 40, and 80 — so what's the use of all the noise? High power might be OK for some things, but when you hear a bird tell his neighboring state he is using 250 watts it sounds like wasted power. Why not have some way to change power and not interfere with some man in France while working local? I use 190 volts for local and have also worked every district with the same power so why make the extra fuss? Here's to less power and more d.c. notes. It won't cost as much and will give a lot more fellows a chance in the same space.

If you should see fit to publish this letter, I hope it will bring me word from a few of my old-time QSO's. They can't all be dead, but just sleeping. I'm almost as old as The Old Man and I also have a cat — but no pipe.

— *Dr. L. G. VanSlyke, W7HX, — Ex 7BJ pre-war*

CQ DX

815 Stewart Drive, Dallas, Texas

Editor, *QST:*

I am having more than a little trouble lately from a certain source, and I am wondering if anyone else has the same curse on them. Every time, not once in a while, but every time I call CQ DX, from one to four U. S. stations answer. Oftentimes the station will be within a thousand mile radius and yet have such a weak signal that

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Telegraph and buzzer portable sets, mahogany case, 2 tone, 4 contact platinum contact, high frequency buzzer, 2 telephone toggle switches, potentiometer, sending key, 3 mfd. condensers, transformer and 2 choke coils, receiver, $30. value $5.00

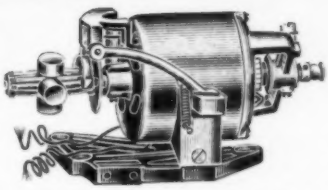
Western Electric Signal "Drops" 1000 ohm, Type D-12 can be used as relay $1.00

Switchboard, 8 line portable Western Electric, magneto ringing; dry cell talking circuit; 8 drops, 26 anti-capacity 12 to 16 terminal key switches, regular price $175.00, special $30.00

Sounders, Signal Corps, 120 ohms, adjustable $2.50

Plugs, Telephone, Switchboard like W.E. No. 146. Each ..... $.50

W.E. Selector No. 60 A (Call Box Type). Each $2.50



Edison Universal motor 1/25 h.p. with governor and Regulator. Has one thousand uses. Price, each $3.50

Rheostats for above ..... .75

Charging panel, Navy type, S.E. 899, 32 volt, Ward Leonard var. and fixed res., Weston voltmeter and ammeter, Sangamo ampere hour meter. Complete with all switches $30.00

Receivers, S.E. 143 and I.P., 500, $100–$150

Relay West. Elec. low voltage, 2 upper and 3 lower platinum point screws, 3 contact arms, $5.00

Extra platinum contact screws or arms ..... $.35

Generator, airplane, Signal Corps, with shaft, can be used as motor, 12 volt, 33.6 amps. 5000 R.P.M. $10.00

Generators, 12 volt, 60 amp. has automatic controls $20.00

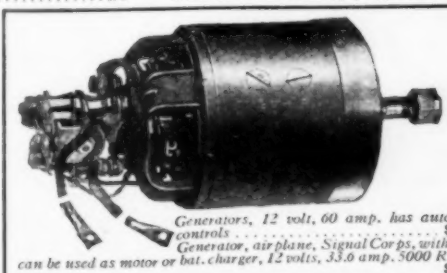
Ammeters, D.C. portable, new Weston model, 45, 3 scale 0–4.5–15 — 150 with 3 scale external shunt and leads ¼ of 1% accurate, $30.00

HERE'S A REAL BUY!

U. S. Army Signal Corps, ¼" solid coin silver contacts, flameproof

Radio Trans. Key, Telltale Lamp, Bakelite base.

$2.00



Generators, 12 volt, 60 amp. has automatic controls $20.00

Generator, airplane, Signal Corps, with shaft, can be used as motor or bat. charger, 12 volts, 33.6 amp. 5000 R.P.M. $10.00

Edison Storage Battery Cells

Type A-4, 1.2 volts, 175 amp., nickel alkali $4.50

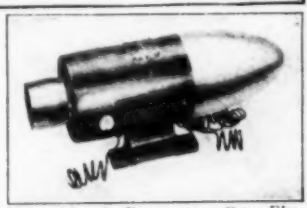
Type M-8, 1.2 volts, 11 amp., never used, per cell $1.50

Type A-6, 1.2 volts, 325 amp., nickel alkali $4.00

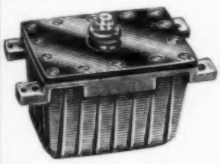
Type L-40, 25 amps. $2.00

(J–3 cells)

NEW — Edison Storage Battery, Type BB-1, 10 volt, 37 amp., contains 7 cells. Complete in steel portable case $15.00



Navy Aircraft Dynamotor, Gen. Elec., new, 24/1000 volts, 1 amp., extended shaft with pulley, giving 24 volts output for filament and 1000 volts for plate or driven by its own input of 24 volts. Value $250.00. Our special price $50.00



Condensers, Mica, op. volts 12,500 cap. .004

Dubilier, new $17.50

Dubilier, used 15.00

Wireless spec. new 15.00

Wireless spec. used 12.50

Condenser, Dubilier, mica, volts 40,000 cap. .0012–.001–.0008 or .003 ..... $25.00

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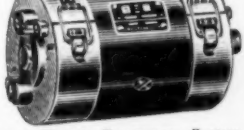
Ammeter, Weston No. 425 thermo-couple 0–2 amp., mtd. on large bakelite base with D. P. hi voltage switch $7.50

W.E. Test Set, lineman's No. 175–125 W. has large variety of uses. Price $8.50



Western Electric Dynamotor System No. C.W. 927. Two 27/350 volt dynamotors in shock-proof hanger. May be used in parallel to give 160 mils at 350 volts, or in series, giving 80 mils at 700 volts. Can be used to operate transmitters up to 50 watts power from 32 volt D.C. mains. Ideal for Delco systems. Two dynamotors in hanger $15.00

Single dynamotor without hanger 9.00

Western Electric Switchboard C.W. 928. Control board for Dynamotor System C.W. 927. Consists of starting switches, fuses, 0–50–500 volt voltmeter with switches for testing main lines and output. Also contains complete filter system. Very special $8.00

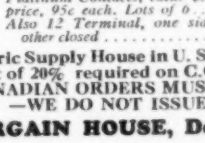
U. S. Navy headphones, excellent for practice and instruction purposes, pair ..... $.75

U. S. Army Special— Baldwin Headphones, Genuine Mica Diaphragm 2000 ohm. Regular $15.00 value $5.00

Extra Armature $12.50

Microphone Cable, 3 wire Shielded, Western Electric heavy duty. Per foot ..... $.12

Generators, Westinghouse 110 volt, A.C. 900 cycles, 200 watts, self excited $15.00



ANTI-CAPACITY SWITCHES W.E. 12 and 16 Terminals, all with Platinum Contacts, value $3.50 each. Our price, 95c each. Lots of 6 ..... $5.00

Also 12 Terminal, one side momentary, other closed ..... $.95

Holtzer-Cabot, "Mike" Utah type, carbon granular transmitter. Special $.95

Western Electric Radiophone Transmitter unit, 326W. Special $1.50

Dynamotor, G.E. Navy Airplanes 24/750 volts. Aluminum frame, unusually good for airplane test work. Specially priced. 200 mils $27.50

Extra Armature $10.00

Ret. coil West. Elec., No. 65A, 1800 ohm 12 henry $2.00

Special:— Only a few left— Magnetos, W. Elec. four bar hand crank $2.50

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Occupation.....

one cannot be sure the station is not DX. By the time I have waited for the station to sign it is too late to search the band for the DX station desired.

To say that this is annoying is putting it very mildly. Surely, in this modern day of world-wide communication a CQ DX most certainly does not indicate that you desire to QSO a station in your own country. If that were the case a plain, ordinary every day CQ should be and would be used. My method of operating is to send a DX just before I sign, as well as one after every two or three CQ's, so the offending station has no excuse to offer.

I have arrived at the conclusion that these operators derive a childish pleasure from this pastime, as they usually fail to come back when you answer them. Sometimes I call them and ask "QTC?" thinking they may have important traffic, but I have yet to get any answer except QRU 73's CUAGN.

More than once in the wee small hours I have called CQ VK and CQ ZL, adding an "only" after each VK or ZL, but the results are the same. Likewise a "CQ DX only" is no more effective. I believe the operators that do this are of the same species as those who, on a directional CQ, call you from the opposite direction.

This surely is not the consideration we hams should show each other. If a station is calling any kind of directional or restricted CQ, do him the kindness to wait until later to call him unless you know that he means your vicinity.

It should not be supposed from the above that I spend all my operating time calling CQ. However, there are times when a CQ is useful and necessary.

I would suggest to the hams in foreign countries that they call CQ on all occasions where they do not want to QSO a particular station. A little thought will show why. Suppose a ZL station wished to work any W station he could QSO. Should he hear one CQ and call him, the one W station would have to find him in the mess of QRM. If the ZL station calls CQ nearly every U. S. ham who is out for DX will hear him and call him. Then the ZL station could choose the loudest signal or the station in the particular section of the U. S. A. he desired. This is not just a theory, because I have seen it work too many times not to be sure.

Turning to a new subject, I want to say that I am strongly in favor of the mythical "High-Power Holiday." Hi! some one says, "He must have a 210 already!" The fact is I am using two 852's in a push-pull tuned-grid tuned-plate circuit with 400 watts input at 2300 volts. All my apparatus is high-power rating. Notwithstanding this fact I would gladly put it on the shelf and give the low-power idea a thorough trial.

— *M. E. Lawson, W5ACL*

Strays

A Rumford Baking Powder can makes a good substitute for a tube shield if the regular type of shield cannot be obtained readily. Ben Branch, of Montgomery, Alabama, suggested this one.

HERE'S A RARE OPPORTUNITY TO COMPLETE YOUR QST FILES

Space doesn't permit us to mention complete constructional and technical information to be found in these issues, but let's take a peek at some of the 1929-1930 articles: the high-frequency superhet for 'phone reception; modern radio telephone design; how to build a 'phone transmitter at low cost; a simple 1750-3500-kc. receiver for beginners; the single-control transmitter; A.C. high-frequency receivers; new ideas in high-frequency transmitter construction; using your broadcast receiver for short-wave reception; the dynatron frequency meter; complete transmitter with tubes and power supply for $45; a two-tube a.c. receiver — and many more!

Future issues of QST, too, will be of greater value to you if you have these copies for their back-issue references.

All 1925 copies (except January, May and July)	**$2.50**
All 1926 copies — complete	**$2.50**
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SIX YEARS OF QST BACK COPIES, NEARLY COMPLETE, WITH INDEX

Can you turn back the pages of time?

If you have the 1920 series of *QST* — and probably you have not — you are one of the few. Even 1922 and 1923 copies are getting scarce. And copies before the war!

A few years from now *QST* copies of to-day no doubt will be just as scarce. Every reader of *QST* appreciates its reference value. We are daily reminded of this fact by the many requests we get for back copies, many of which we cannot supply.

Next year — or probably later this year — you will be looking for a certain 1931 issue of *QST*. You had better resolve right now to keep your copies in a

QST Binder

Note the wire fasteners. Unnecessary to mutilate copies. Opens and lies flat in any position.

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A binder will keep your *QST*s always together and protect them for future use. And it's a good-looking binder, too.

A. R. R. L.
38 LaSalle Road
West Hartford Connecticut

'Phone Gang—All April Contest

(*Continued from page 12*)

the good DX possibilities. For those who have their licenses endorsed for 14-mc. work on 'phone this band will have attractive possibilities, especially for making points in the remote sections in daylight.

RULES

1. Contacts to be counted must take place *in April*. Local time for the station under consideration determines the date.

2. QSL cards must be exchanged by participating stations that QSO, since these are the basis for scoring. At the close of the contest, not later than during the first week in May, all cards should be addressed to stations heard, but particularly to those with whom 100% QSO's have been established.

3. Between the dates of May 15th and 30th, presumably after every such card concerning April operation has arrived, the operators interested will tabulate a list showing the call signal and address of each station worked, with date and time of QSO, also showing separate sections of the list for the different frequency bands used, if more than one band is represented. A similar tabulation should be submitted as made up from cards from individuals reporting "signals heard" during April.

4. The cards or correspondence confirming signals must be sent to A.R.R.L. with the tabulation of claimed score; these must bear a postmark of on or before May 30, 1931, to be counted in this contest. All QSL cards, etc., will be returned to the owners promptly as soon as scores have been checked.

5. Only reports from, and concerning transmission between different parts of the United States and Canada shall count. That is, the competition shall not extend to foreign points, and reports from such points will not be considered.

6. Scoring:

5 points — for each card or letter confirming 100 % QSO.
2 points — for similar evidence of "signals heard."
1 point — for QSO's proven by certified copy of station log (but unconfirmed by cards) or other evidence).

The summation of all such points shall be multiplied by the number of Sections contacted, this number to be confirmed by correspondence sent to the stations entering this contest, from stations located in the "Sections claimed." The fact that a QSO is included in the station log shall not in itself determine a Section as included or not included in the multiplier. See page 5 of this issue of *QST* for a complete list of Sections.

— *F. E. H.*

Experimenters' Section

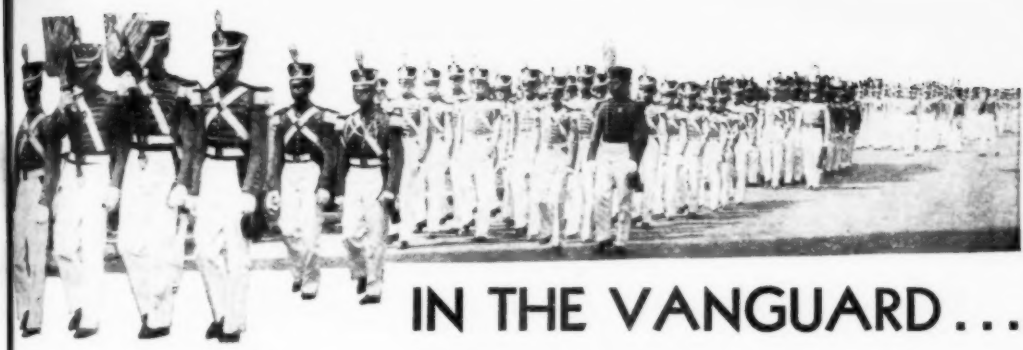
(*Continued from page 53*)

in the hand on the amplifier coil when neutralizing. Such a lamp sells for about 65 cents, and may be found advertised in *QST*.

More on the Doublet

More and more experimenters are finding that the doublet type of antenna is very much worth while for reception. Nearly everyone trying it reports that the signal strength increases and the background noise drops. Here is a letter from E. S. Fritzinger, W3ADX, which tells something about the doublet used at his station:

"I recently erected a receiving doublet primarily for 14,000-kc. reception, but on trying it on 7000 kc. was more than surprised at the results obtained. The doublet is a half-wave 14,000-kc. affair with quarter-wave feeders, as shown in Fig. 2. It is used in connection with a regenerative receiver.



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Advancing confidently, choosing wisely and building solidly, the Leaders, the Vanguard of Radio, push on to new conquests.

Fragile, cheap, unworthy parts find no favor up there, with the Leaders.

Back of good broadcasting, back of radio communication in commerce, in that some-day vital link which is the radio equipment of our forces of defense there exists concrete evidence of faith in "Cardwell Condensered" equipment—CARDWELL condensers are there, where the Leaders put them.

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RECEIVING CONDENSERS—more types and sizes than you suspect unless you have our literature.

TRANSMITTING CONDENSERS—single and twin stator for Amateur use and medium-powered installations.

HIGH VOLTAGE TRANSMITTING CONDENSERS—big, sturdy fellows, used where nothing but the best would be tolerated and failure would be costly.

The New MIDWAY Featherweight is the "Little Dandy" of Variable Condensers

light, compact and small in size, but embodying all of the best features of the larger CARDWELLS. For transmitting and receiving, for aircraft installations and portable sets, and for many other purposes which will suggest themselves when you become acquainted with this trim little condenser. Send for literature describing this and other CARDWELL condensers.

Other recent additions to the Cardwell line—The 510-B and 512-B used for push-pull amplification and neutralization purposes. Two stators, plates rounded and polished overall. Suitable for types 52, 60, 04A and 49 tubes.

Capacity			Air Gap Bet. Rotor and Stator Plates	List Prices	Type	C to C Spacing (between Stator Plates)	Plate Thickness	Number of Plates (ea. Sec.)	Depth (back of panel)
Sections in		Per Section							
Mult.	Series								
.00022	.000055	.00011	.171"	32.00	†510B	.422"	.040"	23	12"
.0001	.000025	.00005	.171"	12.00	†512B	.422"	.040"	11	6½"

REMEMBER, THE CARDWELL "BALANCET" is ideal for matching up intermediate frequency tuned circuits in superheterodynes.

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RADIO TUBES

CX-332 Low Filament Current and Voltage Screen Grid Amplifier

Operating voltages:

Ef	2.0 v.
Eb	135.0 v.
E	67.5 v.
Ec	3.0 v.

IDEALLY suited for storage or dry cell battery operated receivers. The operating filament voltage range is such that a two volt storage battery can be used to operate the filament of CX-332 without a filament rheostat or resistor. In portable sets when dry cells are used a filament voltmeter with an adjustable rheostat is recommended to maintain proper filament voltage.

The mutual conductance of this tube is 505 when operated at the above operating voltages. Good sensitivity will be obtained in radio frequency amplifier circuits and when used with CX-330 and CX-331 a high quality battery operated receiver with low A battery drain is possible.

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"I have only been using one audio stage, which is not uncommon. However, with this receiver volume never has been anything to brag about, but since putting up the doublet the signals sure

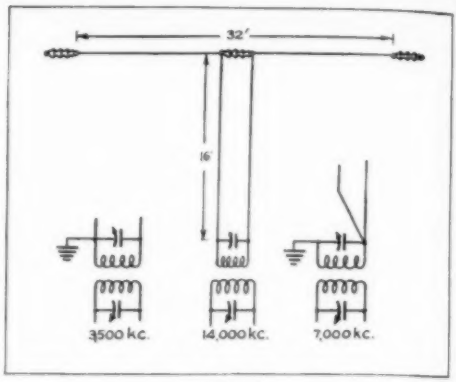

FIG. 2

come through FB. Just this morning I copied enough DX on 7000 kc. to make me want to keep on using it, since it brought in the signals much better than a regular antenna about 85 feet long and much higher — the doublet is only eight feet above the ground. The noise level is much lower than with the large antenna.

"I have not found any increase in volume when using this on 14,000 kc., which is strange; however, the noise level is much lower on this band also."

Using the Transmitting Antenna for Receiving

By W. P. Koechel, W9BNE*

Probably many amateurs are so situated that they are cramped for antenna space; that is, they will find room for their transmitting antennas and then not have a desirable location left for the receiving antenna. To such amateurs it probably will be welcome news to know that they can satisfactorily use the transmitting antenna for reception and be able to work break-in at the same time.

The writer has a transmitting antenna 132 feet long and no room for running a receiving antenna except parallel to the transmitting antenna. Shorter receiving antennas were tried and run in different directions around the house but, due to their shortness, gave very poor results and also did not permit satisfactory break-in operation.

Many different schemes were tried to utilize the transmitting antenna for reception without results. Finally the scheme was tried of attaching the short-wave receiver antenna connection to the exact electrical center of the antenna coupling coil. When this exact electrical center was found and the receiver connected to it, it was possible to obtain all the benefits of a long antenna for reception and at the same time have no inter-

(*Continued on page 66*)

* 224 West Ninth St., Owensboro, Ky.

THE COMMUNICATIONS • DEPARTMENT •

F. E. Handy, Communications Manager — E. L. Battey, Asst. Coms. Manager

The Traffic Station

By **Eugene A. Hubbell** *

In January *QST* (page IV) we invited contributions on every phase of amateur *communication* activity. New ideas and viewpoints, criticisms of and remedies for conditions, hints on DX, suggestions concerning radio club organization, information on interference elimination, exceptional two-way communication work covering emergencies, athletic games and trips, timely attention to operating practise, commentary on the place of radio-telephony, experimenting or development work in present-day amateur radio, data on low-power possibilities, 1750-kc. 28–56 mc. operation, etc., *all* are needed. There is plenty of romance and real accomplishment in amateur work. Read this contribution and the one presented last month. Then give us some real operating stories or the benefit of your views on different subjects.

In addition to publication of the best articles in *QST*, the author whose article appears to have greatest value of those received for consideration, has his choice of (1) a copy of *The Radio Amateur's Handbook* bound in leather cloth, (2) six pads of message blanks, or (3) six of the new type A.R.R.L. log books. Our offer is good throughout 1931. The article presented herewith is the prize-winning article for this month.

— *Communications Manager.*

MUCH has been said in *QST* as to why there should be traffic stations, and why we should have good operators to man them, but not so much on the stations themselves. Measure your station against the qualifications outlined here, and see if it would qualify as a good traffic station.

The primary consideration, of course, is the quality of the emitted signal. A traffic station cannot QSP fast and accurately if the signal is prone to wabble over a large portion of the band, if the dots and dashes have a different pitch, due to a bad chirp, or if the signal is broad and without punch. A crystal controlled pure DC is the best for cutting through QRM and is the most readable at the longest distance. However, we must revise that to fit the terms of traffic work, which brings us to consideration of the circuit to be used.

Crystal control makes break-in difficult and, unless more than one crystal is used, has the disadvantage that operation is confined to one spot in the band, regardless of QRM conditions. It is quite easy to get a stable self-controlled oscillator going, using the minimum of equipment for the best signal needed. If parts used are of correct ratings, or of ample size above correct ratings, there will be no trouble with chirps. If plenty of filter is used, we will still get the DC signal required, and if the transmitter is correctly built, with large capacity and small inductance in the tank circuit, a steady antenna, and a large power supply, we will approach a crystal controlled signal. The ideal circuit [1] in my estimation is a push-pull tuned grid tuned plate, using the resonant choke tuned grid circuit, per November 1930 *QST*. This circuit is single controlled, so far as the oscillator is concerned, and it is a simple matter to QSY.

A DC signal is practically an absolute requirement, due to the fact that the Federal Radio Commission now insists on a plate supply without modulation sufficient to cause frequency variation in the signal. Anyhow, peaked audio requires a DC signal for the best results.

The transmitter should be easily adjusted for QSY. In the case of the high-powered station, riding rough-shod over weaker signals, QSY is not so necessary, but for the fellow equipped with a smaller set, or experiencing difficulty because of skip distance, QSY becomes of marked importance. The transmitter should likewise be equipped with a single control switch for controlling power supply. The best thing, in fact, would be the control system by which it is only necessary to press the key and start sending in order to turn on the whole works. This is accomplished with a delayed time relay in parallel with the keying relay; the delayed time relay closing contact immediately, but opening very slowly. Thus, as sending is continued, the delayed time relay remains closed, but within a set time, depending on the construction and adjustment of the delayed time relay, after sending ceases, the transmitter is automatically shut off.

At the most, one switch is all that is needed, unless a mercury vapor tube rectifier is used, and this can be accomplished by turning the filaments of these tubes on when first entering the station for the evening's operation.

Equipment should be in plain sight of the operator, so that in case of anything not working correctly, he may locate the trouble in a hurry. In regard to this, it is best, I should say, for a traffic station not to be remote controlled. I have had good success with remote control, but every once in a while I find it of great advantage to be able to watch what goes on. Besides this if the transmitter is easily accessible, one may QSY in a few seconds.

Every good traffic station should use break-in. Crystal control makes break-in difficult. Also, when using a large amount of power, this may be difficult, due to the fact that the receiver tubes show a tendency to light up beautifully when the key is pressed. This can be gotten around usually by shielding the receiver, and, if necessary, a considerable part of the receiving antenna. Thus, one might use an antenna for receiving one hundred feet long, and shield the first fifty feet away from the station, by using lead covered cable, or some such thing, until the part of the antenna not shielded was sufficiently distant not to pick up a large amount of radio frequency current.

Another dodge is to use a second keying relay in parallel with the one actually doing the keying, the contacts of the second relay either disconnecting the antenna from the receiver, or, if the separation of contacts cannot be made wide enough for fast operation, grounding the antenna, and still permitting break-in.

Use some means to listen to your sending. Perhaps still another relay can be pressed into service to disconnect the 'phones from the receiving set and connect them to the monitor when sending. Then a perfect check on the frequency, the character of the signal, and the keying will be maintained at all times. If this is not possible, there will usually be sufficient pickup in the receiver to enable the operator to read his sending. If listening continuously on a monitor, it is not possible to work break-in.

The receiver should be single dial control, so that the operator can follow the other station with one hand while writing with the other. Of course if a "mill" or typewriter is used, this is not possible — unless you are an expert at the

* Route Manager, W9ERU, 227 N. 4th St., Rockford, Ill.

[1] Also see "More Power with Better Frequency Stability" page 27, Feb. 1931 *QST*.

"hunt and peck" system. It goes without saying that the receiver should be sensitive, have a minimum noise level, and have accurate calibration. In regard to the latter, it might be noted that the use of a second tube in the detector circuit as a regenerator, per November 1930 *QST*, will render calibration much more exact.

Every station needs a good frequency standard, but a traffic station more than most. Notwithstanding all I have said on the subject of QSY, it is still necessary to stay near a certain frequency to contact schedules rapidly and accurately. Consequently, it is best to pick out a certain frequency and stick as closely to it as possible. A good heterodyne frequency meter of the dynatron type is the one desired. In addition to this, it is necessary to have a good monitor, and for those who desire a really accurate check on frequency, a crystal oscillator built into the monitor box is a very desirable thing. For details on this, see the description in December 1930 *QST* of W1MK's monitor. The transmitter can be kept on or near the crystal frequency or harmonic, and the crystal will furnish an accurate check on the heterodyne frequency meter.

Perhaps this will help some one of you to discover just why it is your traffic total is so low, schedules few and far between, and operation slow and difficult. If so, it fulfils its purpose.

Official Broadcasting Stations

(CHANGES AND ADDITIONS)
(Local Standard Time)

W5AUL (7200 kc.) Mon., Wed., Fri., 6:00 p.m.
W5PP (3500 kc.) ('phone) Mon., 7:00 p.m.; Fri., 7:00 p.m.
W8DME (3890 kc.) Mon., Tues., 7:00 p.m.
W8DME (14,200 kc.) Sat., 7:00 p.m.
W9AFN (3600 kc.) Sun., 1:00 a.m.
W9AFN (7200 kc.) Sun., 1:15 a.m.; Fri., 7:00 p.m.
W9DDB (3750 kc.) Mon., 8:45 p.m.; Tues., Thurs., 7:00 p.m.
W9JL (7185 kc.) Mon., Wed., 12:15 p.m.; Sat., 5:30 p.m.

BEGINNERS, ATTENTION!

February *QST* contained a complete list (correct to February 1) of the 1750 kc. amateur stations that are sending code practise and other information for your especial benefit. We are pleased to announce this month that W5ALF at Pawnee, Oklahoma, W8CUW at Dolgeville, N. Y., and W9GDL, Cornhusker Amateur Radio Association, Lincoln, Nebraska, have added their services to the 1750 kc. volunteers. W5ALF will transmit code practise every Monday and Thursday on 1800 kc. from 10:30 to 11:00 p.m. (or later) C.S.T. W8CUW will transmit on 1750 kc. at 7:15 to 7:45 p.m. E.S.T. daily except Sundays, and at 8:30 to 11:00 a.m. on Sundays. W9GDL will transmit every Friday at 10:30 p.m. C.S.T. on 1715 kc. W9DKL at Redfield, South Dakota, may also be heard sending code practise from time to time on 1764 kc. A complete, up-to-date list of stations sending code practise on the 1750 kc. amateur band will be gladly sent to you, if you will but drop us a line.

Change in W1MK Operation

A.R.R.L. Headquarters Station W1MK now operates on frequencies of 14004 kc., 7002 kc., and 3960 kc. in addition to the well-known 3575 and 7150 kc. channels.

Attention is called to the use of the various frequencies for Broadcasts and General Operating Periods outlined in the table shown below. A frequency of 14,300 kc. is also available for use.

At the request of West Coast amateurs a broadcasting schedule has been added on the 14-mc. (20-meter) band. Also, we are inaugurating some "general" operating periods so that more west coast A.R.R.L. members may contact Headquarters. Since the operating hours of the station are limited it is not possible to give up much time to 14-mc. operation now, but if this operation works out favorably some further changes in schedules may make it possible to expand further. Reports on the 14-mc Official Broadcasts are requested from amateurs on the west coast. These broadcasts were started at the special request of west coast members and, unless they are being used, they must be discontinued in favor of 7-mc. transmission.

The new schedule for Official and Special Broadcasts, and General Operating Periods is printed below. *General Operation* periods have been arranged to allow every one a chance to communicate with A.R.R.L. Headquarters. These general periods have been arranged so that they usually follow an *official* broadcast. In all cases the time shown is Eastern Standard.

SCHEDULES are kept with the following stations through any of which traffic will travel expediently to A.R.R.L. Headquarters, on 3500 kc.: W1ACH, W1ZB, W2JF, W3BWT, W3CXM, VE3GT, W4DV, W8CUG, W8DLG, VE9AL, W9BCA, W9OX; on 7000 kc.: W4AGR, W4DV, W5EB, W6EXQ, W9ERU, and DAIV.

QSL CARDS for W1MK should be addressed in care of A.R.R.L., 38 La Salle Road, West Hartford, Conn. A complete log of every transmission is made and W1MK is always glad to send any station worked a card, but frequently cards are lost when sent direct to the station at Brainard Field. W1MK QSLs after receipt of card.

W1MK OPERATING SCHEDULE
(Effective March 29)

OFFICIAL AND SPECIAL BROADCASTS

	Time (E.S.T.)	*Frequencies (kc.)*
Sunday	8:00 p.m.	3960–7150
	Midnight	3575–7002
Monday	8:00 p.m.	3575–14004
	10:00 p.m.	3575– 7002
Tuesday	8:00 p.m.	3960–7150
	Midnight	3960–7150
Thursday	8:00 p.m.	3960–7150
	Midnight	3960–7150
Friday	8:00 p.m.	3575–14004
	10:00 p.m.	3575– 7002

GENERAL OPERATING PERIODS

Sunday	8:15– 9:00 p.m.	3960
	10:00–11:00 p.m.	7150
	Midnight–1:00 a.m. (Mon.)	3575
Monday	7:30– 8:00 p.m.	14004
	8:15– 9:00 p.m.	14004
	10:15–11:00 p.m.	7002
	Midnight–1:00 a.m. (Tues.)	7002
Tuesday	8:15– 9:00 p.m.	3960
	10:00–11:00 p.m.	3960
	Midnight–1:00 a.m. (Wed.)	7150
Thursday	8:15– 9:00 p.m.	3960
	10:00–11:00 p.m.	3960
	Midnight–1:00 a.m. (Fri.)	7150
Friday	7:30– 8:00 p.m.	14004
	8:15– 9:00 p.m.	14004
	10:15–11:00 p.m.	7002
	Midnight–1:00 a.m. (Sat.)	7002

With the 'Phones

3500-KC. WORK

'PHONE activity continues to center on the 3500-kc. 'phone band. DX is steadily improving. A number of 'phones have been heard in England during the past month.

Perhaps the most outstanding bit of 'phone work during February was the "All District Hook-up" of nine stations, each of which successfully worked the other eight in turn. The following stations were participants in the nine-way QSO which started at approximately 3:00 a.m. and lasted until about 7:00 a.m. E.S.T. on February 10: W1APU, W2ACA, W3AVY, W4WS, W5PP, W6FEV, W7ANT, W8BEX and W9EOD. Who can beat this?

W9EIM, Abilene, Kansas and W7AUS, Granite Falls, Wash. are keeping a daily schedule on low power 'phone (each using less than 10 watts). On February 6th a four-point QSO was established between W9EIM, W7AUS, W7AHN and W6BQI — and all of these stations use low power. W1AVK, W1AUY, W1IO and W1BCR have been heard in England several times. It is reported that W1AWO heard G2NM's 'phone on February 22nd. FB! W1BMT was reported in England as having quality and strength of signal equal to W3XAL, Bound Brook!!

W1BCR reports: "The N.A.R.L. is distributing 1200 copies of its new 'phone call book. Write for 'QRA form' if you wish to be in the next issue. New section control stations are W9CJJ, Denver, Colo. and W4TM, Bemis, Tenn. Sunday meetings take place at 1:00 p.m. now to accommodate fellows who observe quiet hours. Control stations are W1BCR, W1AHB, W1AUY, W1AVK, W2BZA and W8DRZ. We expect every member of the N.A.R.L. to write his A.R.R.L. Director and tell him what he thinks should be done to help the 'phone situation. Don't put it off. Write to-day! If your letters don't reach your Director before the Board meeting action may be delayed another year."

W1AVK recently worked W7II, W6CNE, W6BIU, W6ABF, W6BJQ and W5AWF all in one night on 3.5 mc. 'phone. W1AUY was heard in Arizona QSA5 R7. W8BOK signs himself, "The Cat's Meow" (listen for that feline cry). W1CMP signs "The Connecticut Master Plumber." W2TL is "Thunder and Lightning." W1QT is "The Voice from Sunset Lake." W1BCR is rebuilding the entire speech input system. W2BZA has his new outfit on the air. W2CDE is on again. W3ZA sure perks out F.B. W4TM is using a pair of type '12D's in Linear p.p. W6CNE and W6FEV pound through consistently on the east coast. W7ANT sends the following reports: W7AAO has been on 'phone for the past two years. W7ACY and W7AFX have recently opened up on 'phone. W7ART is a 13-year-old Boy Scout. W7ATV neglected to renew his station license in time and is forced to remain silent temporarily. W7BZ is on 'phone occasionally, W7CN is one of the most active 'phones in the seventh district. W7CS and W7AUS are new converts to 'phone. W7HO operates the Airways 'phone at Boeing Field, Seattle, Wash. W9CJJ, Colorado, is doing fine work in his district and is getting the fellows to write their Director. W9FKE crashes through quite consistently. W9ESL has an Army-Amateur 'phone net which works very f.b. W7NK is a radio engineer. W7RY gets on as often as he can between working hours. W7SL locates QRM for the Light Company in Seattle. W7TS is carrying on some interesting experiments. W7VF is very active.

While W5AXU, Alexandria, La., was QSO W5BHO, Houston, Texas, he told BHO that he knew some YL's in Houston and would like to chat with them via radio. W5BHO arranged for the YL's to be at his station the following evening and a pleasant QSO ensued.

On March 2nd W2BWG and W2BCO carried on a very unique 'phone QSO. W2BWG used a 1750-kc. transmitter and 3.5-mc. receiver; W2BCO used a 3.5-mc. transmitter and 1750-kc. receiver. While copying W2BCO, W2BWG heard W2COJ come on and call W6CNE. BWG requested BCO to stand by and listen to BWG's receiver through the transmitter as the microphone was close to the l.s. BCO heard W2COJ QSA5 R9 through the pick-up at W2BWG. A few moments later BCO also reported W6CNE coming back to W2COJ on 3500 kc. via W2BWG on 1750-kc. W6CNE's signals were QSA4 R7 when received at W2BCO.

During a recent QSO with W3GS, G6RB reported that many 'phones in England are working on both the 3.5-mc. and 1750-kc. bands. He states that they are not limited in power, but that none use more than 150 watts. Also, they use 'phone over the entire 3.5-mc. and 1750-kc. amateur bands, and the bands are the same size as the United States.

Send in any useful 'phone constructional kinks which might be used in the Experimenters Section of *QST*. As an example, W1AZH uses metal vegetable bins, 14 inches long, 10 inches deep, built by the Stanley Works, New Britain, Conn., as containers for the various units of his transmitter (one for the buffer, modulator, speech amplifier, power pack, and so on). Stacked like a sectional bookcase, these make a very neat arrangement. Let's have more such suggestions. Perhaps there are some unique constructional details to your station. Tell the gang about them.

W9BNT lists the following 'phone stations interested in the Army-Amateur 'Phone Net in the Seventh Corps Area: W9AAN, W9ADB, W9ADE, W9AEI, W9AES, W9AHO, W9ALO, W9APF, W9ATZ, W9AVA, W9AVQ, W9AWE, W9BAK, W9BBF, W9BDF, W9BGG, W9BHN, W9BJY, W9BLX, W9BNX, W9BSC, W9BSI, W9BWS, W9BXP, W9BZL, W9CBR, W9CKL, W9CKT, W9COE, W9DB, W9DGF, W9DID, W9DIU, W9DKJ, W9DKL, W9DNS, W9DPG, W9DRK, W9DSR, W9DWF, W9DWN, W9EAT, W9ECF, W9EIM, W9EJE, W9EJF, W9ESL, W9EXK, W9EZJ, W9FAD, W9FAJ, W9FAL, W9FDB, W9FEG, W9FLL, W9FLM, W9FLZ, W9FME, W9FNV, W9FOF, W9FUE, W9FXV, W9GED, W9GGY, W9GHC, W9GHI, W9HL, W9PV, W5QV, W5SI.

1750-KC. WORK

The 1750-kc. band continues to become popular. There are at least five times as many stations now working on that band than there were a year ago. Both radiophones and c.w. stations alike report many 100% QSOs in daylight over distances greater than 500 miles. Fellows who wish to get away from the congested, nerve-wracking conditions on 3500 kc. are urged to try this lower frequency. On January 15th, W1AYV, Cohasset, Mass., had a 100% QSO with W3RP at Middle River, Md., on 1750-kc. radiophone. Communication was maintained with R7–9 signals at both ends from 9:30 to 11 p.m. E.S.T. Both stations used 50 watts power. On January 18th communication between these same two stations was established and maintained from 3:30 to 4:30 p.m. E.S.T. with R5–7 signals. This daylight communication on 1750 kc. over a distance of more than 500 miles shows that this band has possibilities.

14,000-KC. WORK

In a report on 14,000-kc. 'phone work, W8DLD says: "There is not one poor U. S. A. 'phone heard here on the 14-mc. band. Some 25 cryatal 'phones are received at different times. A list of the good 'phones heard regularly here on the 14-mc. band: W1AXA, W4AGR, W4WZ, W5QL, W6AJ, W6KT, W8FZ, W8RD, W9ANZ, W9BKO, W9DEF, W9DRD, W9LD. The following are also heard often: W1AXV, W1FH, W1UH, W2AOG, W2GG, W3ZX, W5MM, W8BUD, W8CF, W8EM, W8WM, W9PV, W9QY. The 14 mc. 'phones will handle traffic and do it quickly. All we ask is that it is good traffic and that it is going a few thousand miles. Hi."

During the Transcon Relay a couple of the 'phone messages traveling from west to east were erroneously started on the 14-mc. band. While relays on that band cannot count in the Transcons, the message handling work of the 14-mc. 'phone gang is worth reporting. On the first Sunday of the transcons W6KT, La Verne, Calif., sent his message on 14-mc. 'phone to W8NB at Ann Arbor, Mich. W8NB did not relay due to the rules which stipulated that only 3500 kc. was to be used. W6CRK also started his message on 14 mc. in addition to 3500 kc. The 14-mc. route was as follows: W6CRK, W6KT, W9BKO, W8DLD, W4AGR, W8DLD, W9BKO. The time elapsed in getting the message to W4AGR and answer back as far as W9BKO was five hours, fifty minutes. On the third Sunday, W6KT gave his message to W8RD on 14-mc. 'phone. W8RD shifted to 3500 kc. and relayed on to W8AWQ.

14-MC. 'PHONE REQUIREMENTS

Inquiries are regularly received regarding what is required of an amateur operator desiring to operate radiotelephone stations in the 14,001–14,300-kc. band. Upon application, any amateur showing that he is the holder of an extra first-class amateur operator's license or higher, will be licensed to operate amateur radiotelephone stations in the above-mentioned band. An amateur who holds an amateur operator's license other than extra first class may be authorized by the licensing authority to operate radiotelephone in the band of frequencies referred to, provided it is shown that such amateur possesses special technical qualifications satisfactory to the licensing authority. Since it is impossible to lay down a rule which would cover every case of this kind, the Federal Radio Commission requires that any amateur wishing to use 'phone on the 14 mc. 'phone channel, but who does not hold an extra first-class amateur operator's license, to submit a complete detailed statement showing: (a) technical education; (b) technical experience; (c) operating experience, if any; (d) any research or special study of high frequency radio equipment; (e) equipment owned by the applicant which will be used in radiotelephone transmission described in detail; (f) other equipment or facilities available for use by the applicant; (g) special development work in which the applicant is particularly interested; (h) any other data which shows special qualifications of applicant to operate in this particular band of frequencies; (i) references from whom information with respect to the ability of the applicant may be obtained. The information above referred to must be submitted by the applicant, under oath as to the truthfulness of all the statements made by him. Applications for special permission to use radiophone in the 14-mc. band should be made through your local Radio Supervisor, in duplicate, from whom they will be referred to the Federal Radio Commission for action. These requirements were contained

in a memorandum from the Commission dated in January, 1931.

'ROUND THE WORLD RELAY BY 'PHONE

On the occasion of the Centennial Anniversary Celebration of the *Palladium*, a Richmond, Ind., newspaper, on January 3rd, W9FKE, 3500-kc. amateur radiophone started a message for relay around the world. The message filed at W9FKE by C. Francis Jenkins, famous inventor and experimenter, read: "Congratulations Palladium Centennial Celebration. A radio amateur first talked half-way around the world. Another will one day similarly extend our vision. The *Palladium* will record the feat." W9FKE sent the message to all coöperating amateurs at 7:22 p.m. C.S.T., including W8AQK, W3AEX, W2BZA, W1BCR, W1MK, W2ZC, W3HM. W8AQK at Pittsburgh okayed the message and shifted to the 14-mc. 'phone band, where he had a prearranged schedule with Afghanistan. This schedule did not materialize but W8AQK did contact VS3AR at Johore Baharu in the Malay States, 33 miles from Singapore, India. This is a little further than half-way around the globe from Pittsburgh. VS3AR gave a complete check on the message and repeated it back to W8AQK, who in turn sent it back to W9FKE. W1MK (c.w.) also took the message from W9FKE and sent it to W4AEF, Lakeland, Fla., on 7000 kc. From W4AEF it went to W6EAK and to ZL2GQ the same night. W6ETJ was standing by to assist W1MK in any way possible. The total time for the message to travel the route W9FKE-W8AQK-VS3AR-W8AQK-W9FKE was *37 minutes*. W9EPH, a c.w. operator present at W9FKE during the relay, writes: "I have maintained many schedules on c.w. but have never seen an accomplishment either c.w. or 'phone to compare with this incident. W8AQK should be given much credit for his participation as well as all others who helped W9FKE put this relay over. More power to you phone stations."

Traffic Briefs

For some time past W8ADM, G2VQ and ZS4M have been keeping a three-way schedule at 1700 G.M.T. daily. Contacts have been so good that they have been QSO for periods of three hours before signals fade out. That's what we call inter-international QSOs. FB.

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Be optimistic. W9BAN says, "Sure, I'm optimistic . . . like the ham who used a 199 with 90 volts and put 'U. S. A.' on his QSL card." Chass!!

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W8DII claims that his is the only call in the world which ends in four "ditdits." Try it on your bug!

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NEW QSO ENDURANCE RECORD

A new "QSO Endurance Record" has been made, broken, and broken again. In January *QST* we declared W8BTK and W8DEH the "record holders" in our "QSO Endurance Contest" (see page XVI, November '30 *QST*). Their record of seven hours and ten minutes was broken by W5WF at Shreveport, La., and W5AUG at Kiefer, Oklahoma, on January 13th when they maintained perfect contact for *seven hours and thirty-six minutes* (9:29 a.m. to 5:05 p.m.). And then on January 23rd W9BNR and W9ENQ stepped up to their keys and beat that record by 19 minutes, holding a *seven hour and fifty-five minute* QSO (10:50 p.m. Jan. 23 to 6:50 a.m. Jan. 24). On February 7th and 8th W6EMA and W6EZP, both in San Diego, California, were in continuous communication for *18 hours*, breaking all existing records. They say that is an easy mark and expect to beat their own record later. W5BPL reports that on the morning of February 15th W5QJ, New Orleans, La., and W5APM, San Marcos, Texas, maintained an unbroken QSO on 3500-kc. 'phone for *four hours and twelve minutes*. Who can beat that on 3500-kc. radiophone.

The "Endurance" records to date are as follows:

					Hrs.	*Mins.*
W2AMT–W4ABS	maintained	perfect	contact	for	3	42
W5QJ–W5APM	"	"	"	"	4	12
W8BTK–W8DEH	"	"	"	"	7	10
W5WF–W5AUG	"	"	"	"	7	36
W9BNR–W9ENQ	"	"	"	"	7	55
W6EMA–W6EZP	"	"	"	"	18	

The present record of *eighteen hours* is held by W6EMA and W6EZP. What two hams will throw their hats into the ring and beat this? More contestants are invited to send in logs. The only requirement is that you abide by the rules set forth in November ('30) *QST*.

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The Associated Radio Operators of Denver (Colorado) report via their Secretary, W9GBQ, as follows: "Since the election of W9ESA as SCM the gang out here seems to be getting pepped up. Due to the new interest stirred up, our attendance has jumped to two-thirds of the total membership, and we are continually growing with new applications every meeting night. The Army Net is also starting up and traffic handling is beginning to interest some long dead stations."

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REPORT ON OLD TIMERS' WEEK

But few reports were received on our "Old Timers' Week" announced for the period January 1 to 7 inclusive. W1AQL reported many old stations logged but only one QSO, with W8WJ. They had a very pleasant chat, exchanging memories of the "ole days." AQL says, "It sure is a pleasure to QSO one who has been in the game from away back in the spark days and talk over old events." Yea, verily, brother! W2BRB was on the job but didn't work a soul who mentioned "Ye Olde Timers Weeke." W6DF writes as follows: "Sunday evening, Jan. 4 (during Old Timers' Week) I was talking on the telephone with W6EWI. He informed me that he had a baby transmitter on the air and wanted me to listen and criticize his signals. By means of radio to me and telephone back to W6EWI we smoothed out a little chirp, etc., and thereby halfway qualified for Old Timers' Week. And to show that EWI and I are old timers, I checked back through my old notebook logs, and what-not, and uncovered the following information: In January *1907* George Martin (W6EWI) and I each had a feeble spark coil transmitter and a needle and carbon microphone detector of that day. We lived some four miles apart (DX in those days — hi) but it was with great difficulty and much straining of hearing apparatus that we ever made two-way contacts. We, therefore, often resorted to the telephone. One of us would send for minutes at a time, while the other, having been advised over the 'phone that signals were on the air, would dash to the receiver and with much patient playing with the needle on the carbons, would sometimes get a signal which could be identified as the desired one. Thus, history repeated itself on the evening of Jan. 4, 1931, and even if we only half-qualified for the 'Old Timers' Week,' I claim that we are at least *real* old timers." We'll say you are, OM. W8BSR reports working several W6s, CM2FN and VK3ML during "Old Timers' Week."

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Even though you may not like to handle traffic, it is not exactly courteous to "leave a fellow flat" when asked to QSP. W8DJQ has had several irritating experiences with this kind of operator. If you cannot or do not want to QSP, say so — you will not offend the other operator half so much as though you immediately QRT or burst forth with an untimely CQ. Think it over.

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BRITISH QRP TESTS

The Contact Bureau of the R.S.G.B. announces "One Watt Week" during which low power enthusiasts hope to determine the maximum distance over which communication can be established when using inputs of *not more than one watt*. All amateur frequencies may be used. The tests commence at 2100 G.M.T. on April 11, and finish at 0800 G.M.T. on April 18. All A.R.R.L. members hearing weak "G" signals between the hours of 2100 and 0800 G.M.T. on any night of the tests are requested to hang onto these signals and endeavor to make contact. Whether or not contact is established it is requested that full reports on stations heard be sent to M. W. Pilpel, G6PP, 54 Purley Avenue, London, N.W.2.

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COMING — CLUB MEETINGS

The Arrowhead Radio Amateurs of Duluth (Minnesota), Superior (Wisconsin) and vicinity will hold their Second Annual Banquet and Hamfest on April 18 and 19. The affair last year was a real success and the outlook this year is 100% better. All amateurs who can possibly attend are invited to get in on the fun. Full information may be obtained from the A.R.A. Program Director, Palmer Anderson, W9DOQ, R. 1, Box 270, Duluth, or from the President,

L. E. Lindesmith, W9GKO, 1055 85th Ave., West, Duluth. Write for particulars to-day!

The "1931 QSO Party" of the Milwaukee Radio Amateurs' Club, Inc., is scheduled to take place at the club room, Hotel Pfister, Milwaukee, Wisconsin, at 6:30 p.m. April 25. These QSO Parties usually reach the proportions of a convention, and are well worth attending. Make your reservations early by sending $2.00 to Fred Catel, W9DTK, 711 Kenwood Blvd., Milwaukee. Act now, and get in on this very enjoyable "QSO Party."

Traffic Summaries

(JANUARY–FEBRUARY)

Pacific led by Los Angeles	11642
Central led by Ohio	11250
Atlantic led by Eastern Pennsylvania	10776
New England led by Connecticut	6694
Midwest led by Missouri	4000
West Gulf led by Oklahoma	3014
Roanoke led by Virginia	2677
Northwestern led by Oregon	2439
Delta led by Louisiana	2388
Hudson led by New York City and Long Island	1750
Dakota led by Southern Minnesota	1609
Rocky Mountain led by Colorado	1022
Quebec	1004
Ontario	999
Southeastern led by Georgia-South Carolina-Isle of Pines-Porto Rico-Virgin Islands	544
Vanalta led by British Columbia	386
Prairie led by Saskatchewan	135

982 stations originated 14 674; delivered 11,172; relayed 36,483; total 62,329 (76.2%).

Ohio makes the highest bid this month — 3223! The Pennsylvanias are next in line — Eastern, 2738; Western, 2528! The other sections with totals over 2000 are: Los Angeles, 2450; Michigan, 2444; East Bay, 2431; Md.-Del.-D. C., 2313; and Illinois, 2039. Los Angeles is trying to make a come-back. Eastern Pennsylvania says, "next month is our month." Time will tell. The Pacific Division is first in line, the Central having led for the last three months. Watch them! It looks as though they have taken second place long enough.

Attention! The Board Meets

THE next annual meeting of the Board of Directors of the A.R.R.L. will be held on May 1st and 2nd. Each Director needs contact with *all members* within his Division prior to the Board Meeting so that he may know the sentiments of his constituents on all subjects to be considered at the Meeting. Every League member should feel it his *duty* to contact his Director and set forth his opinions on all important questions relative to amateur radio.

There are so many differences of opinion in the ranks of our 'phone-member operations (not to mention solutions proposed by c.w. men), regarding what should be done to improve general operating conditions, and what recommendations the Board of Directors of the American Radio Relay League should make on the request of 'phone operators for an extension of the 3500–3550-kc. 'phone allocation, that we are including some questions covering possible methods of approach to this question. It is hoped that every A.R.R.L. member will take the opportunity to go on record with his personal representative, the Director, not only on this question, but on *all* others concerning the welfare and enjoyment of members — and amateur radio. Constructive ideas are sorely needed — and how can your Director represent what *you* want unless you give him a full expression of your wishes and opinions?

Clip the list from the magazine and mail to A.R.R.L. Headquarters, West Hartford, Conn., to be tabulated and turned over to your Director. Remember, *time is short — fill out the list. Mail now!*

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1. Many operators believe that 'phone is growing, and that allocation of more frequencies *alone* will not solve the

BRASS POUNDERS' LEAGUE

Call	*Orig.*	*Del.*	*Rel.*	*Total*
W8CHC	625	141	862	1628
KA1HR	271	227	934	1432
W3CXL	46	181	914	1141
W6ALU	16	69	682	767
W5VQ	31	32	639	702
W3BWT	246	153	279	678
W6QP	97	147	395	639
W9DZM	195	136	284	615
W3SM	137	49	421	607
W5AHI	17	22	535	574
W5WF	98	85	344	527
W6AMY	28	6	466	500
VE3GT	133	139	219	491
W6HM	182	303	1	486
W8GZ	27	58	394	479
W6AKW	46	36	374	456
W9EJQ	9	28	418	455
W3GS	87	52	310	449
W3CXM	37	104	303	444
W1MK	103	137	187	427
W6AZH	14	62	342	418
W7ACH	20	25	328	373
W8CMB	58	94	207	359
W1AWU	119	57	169	345
W1IP	20	42	276	338
W9ESU	55	62	220	337
W3ZF	97	12	220	329
W8DLG	24	25	277	326
W8BGX	10	15	300	325
W1ATF	145	89	85	319
W8DSS	20	15	278	313
W6YG	162	60	84	306
W8DDS	109	92	104	305
W1CJD	27	12	266	305
W9CVQ	55	40	208	303
W5BMI	87	80	133	300
W6CYD	12	15	266	293
W6AOA	32	34	225	291
W4RP	88	42	158	288
W6ASH	25	39	222	286
W9BJA	25	72	186	283
VE2AC	107	79	92	278
W5WW	35	31	210	276
W9BMA	28	8	234	270
W9GFL	45	17	193	255
W3AIZ	240	8	4	252
W3NF	9	42	194	245
W6DRU	3	—	242	245
W7AAT	24	34	186	244
W8OK	52	27	162	241
W9CEE	91	32	117	240
W8BTK	7	13	220	240
W9HK	62	14	162	238
W6BRV	16	11	211	238
W1ASY	58	27	152	237
W3AMB	141	23	73	237
W6ALW	3	16	217	236
W6AXV	202	32	—	234
W2LU	32	21	179	232
W9ACL	5	31	194	230
VE2AP	24	79	126	229
W8DYH	17	16	196	229
K6AJA	209	7	12	228
W8DBX	26	26	175	227
W3MG	36	21	170	227
W5AMC	59	69	98	226
W9CKG	15	52	159	226
W9QT	53	30	143	226
W6CIQ	217	3	6	226
W1BD	45	50	129	224
W9DGS	28	89	96	213
W2SC	52	55	104	211
W8DEJ	43	19	148	210
W6AHO	89	36	80	205
W9CE	21	12	172	205
W6EDO	12	56	136	204
W1LM	22	39	142	203
VE2BB	14	9	179	202
W9CFL	15	100	86	201
W8CFI	26	34	104	200
W3BM	22	14	164	200
W6EKC	62	53	82	197
W6ETJ	58	53	86	197
W3MC	35	64	95	194
W6ABB	38	76	70	184
W1BAC	47	57	70	174
W7ZD	9	61	96	166
W6WA	67	71	19	157
W9BN	45	54	50	149
W8APQ	47	53	26	126
W9ERU	31	59	13	103
W1ASF	47	53	—	100
W2CDQ	13	52	34	99
W8BHK	16	57	22	95
W6BYY	6	67	17	90
K6BOE	14	50	25	89
W6AMM	21	51	16	88
W6BAX	9	51	4	64

All these stations appearing in the Brass Pounders' League are noted for their consistent schedule-keeping and dependable message-handling work in amateur radio. Special credit should be given to the following stations in the order listed responsible for *over one hundred deliveries* in the message month: W6HM, KA1HR, W3CXL, W3 BWT, W6QP, W8CHC, VE3GT, W1MK, W9DZM, W3CXM, W9CFL.

Deliveries count! A total of 200 or more bona fide messages handled and counted in accordance with A.R.R.L. practice, or just 50 or more *deliveries* will put you in line for a place in the B.P.L. Why not make more schedules with the reliable stations you hear and take steps to handle the traffic that will qualify *you* for B.P.L. membership also?

problem of permanently enjoyable 'phone operation. Do you agree with this? ..... Do you agree that more frequencies for 'phone are needed? .....

2. Do you believe that no 'phone operation should be permitted on a Temporary Class operator's license? ..... On the regular Amateur Class license? .....

3. Do you favor a 'phone class operator's license? .....

(a) Should this be given only following one year's general amateur experience? .....

(b) Should this be given only after passing a technical examination, including questions covering approved modulation systems, use of methods insuring requisite frequency stability to prevent undue broadness, adequate technical knowledge of the adjustments involved in the 'phone station it is proposed to operate? .....

4. Should a 'phone class operators license be necessary for operation in *all* 'phone bands? ..... For which? .....

5. I favor a 3500 kc. 'phone allocation, total width not to exceed:

(Indicate which): 250 kc.; 200 kc.; 150 kc.; 100 kc.; 50 kc.

6. In case an increase in the 'phone frequencies is considered that might extend the present band to 3600 kc. (multiple is 14,400) or beyond 3650 kc. (multiple 7,300) would you propose that such 'phone allocation be made at the *high* frequency (4000 kc.) end of the band to facilitate using a single crystal for operation in all three bands? ..... (yes or no).

7. I believe that the 1750 kc. band should be divided, reserving

150 kc.
100 kc.
50 kc. } at the high frequency end for experimental 'phone work? .....

8. I favor an allocation in the 3500–4000 kc. band for c.w. and 'phone which is proportional to the *number* of each type of station actually working in that region. (Yes or no) .....

9. Would you apply this principle of division to 14 mc. 'phones as well? ..... to 1750 kc. 'phones? .....

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Please help us get a true picture of operation in all our amateur bands by completing the following form and returning to A.R.R.L. Headquarters at once:

Call signal..... Plate input watts.....
Name ..... Age .....
Address.....

Please indicate relative per cent of operating time spent:

(1) On C. W.....
On Phone.....

100%

(2) In traffic work.....
Friendly rag-chewing.....
DX records.....
Experimenting.....

100%

(3) On 1750-kc. band.....
" 3500-kc. " .....
" 7000-kc. " .....
" 14-mc. " .....
" 28-mc. " .....
" 56-mc. " .....

100%

I have a crystal control transmitter?.....
I have a quartz-crystal frequency std?.....
Temperature control?.....
My frequency meter is of the:
Dynatron-type.....
Heterodyne-oscillator feed-back type.....
Absorption type.....
Indicator?.....

DIVISIONAL REPORTS

ATLANTIC DIVISION

WESTERN PENNSYLVANIA — SCM, R. M. Lloyd, W8CFR — W8DLG reports twenty schedules per week. W8APQ worked a seven on 3.5 mc. W8CUG has cut down his schedules. W8CMP guesses Warner's February editorial was right! W8CEO has decided to give crystal a whirl. W8AVY is building a dynatron frequency meter. W8DUT worked W8CYP, who has just returned after a two years' silence. W8AGO is not in town consistently and says this keeps his total down. W8DKS reports W8CBA is on 3.5 mc. W8BRM is working away from home. W8AJU is all set for traffic work. W8DGW has lost all his teeth. Hard luck, OM. W8YA is still after a license. W8CHC comes through with a big total. W8BSE has a nice total once again. W8ASE says he hasn't changed his transmitter this month! W8DYL now has a push-pull MOPA. W8CRA handled the I.A.R.U. report from Norway this month. W8AYH worked his first VK. W8FJ is rebuilding for 14 mc. W8DFA sends a long list of news: W8CDH, W8DCY, W8BJG, and W8DFA all visited the Central West Virginia Radio Club. W8BK has quit crystal. W8AUC is building a new ¼ KW transmitter. W8ADB is working on an AC receiver. W8AMY and W8CKO are both using crystal control. W8BYE has an MOPA. W8BSO is going on C.W. W8CFR's mast has broken off, and he is hoping for some nice weather.

Traffic: W8DLG 326, W8APQ 126, W8CUG 110, W8CMP 90, W8CEO 23, W8CFR 14, W8AVY 12, W8DUT 12, W8AGO 10, W8DKS 6, W8AJU 4, W8DGW 4, W8CHC 1628, W8BSE 103, W8ASE 30, W8DYL 12, W8CRA 11, W8AYH 4, W8FJ 3.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Forrest Calhoun, W3BBW — Maryland: W3ADO has a 56 meg. transmitter and receiver. W3AFF handled a few. W3AHG sent in a nice report. W3BBW had QRM from new hams looking for information. W3PU says he can QSO all Districts any night on 3.5 meg. W3AOO gave an original alibi for low total — too much DX. We welcome as new ORS — W3ED. W3LA is trying television. W3NY is having trouble with Power Supply. Delaware: W3HC has joined the A.R.R.L. net for the American Legion. W3ALQ had scarlet fever so no brass pounding. District of Columbia: W3CXL takes the lead this month. Kimmel of W3CXL took the fatal leap New Year's eve. Congrats, OM. W3BWT still holds his own. W3BAT is a new ORS in Washington. W3OZ was QSO G5BY on 3.5 meg. W3CAB reported as usual. W3AKR has moved his station to another part of his house.

Traffic: W3CXL 1141, W3BWT 678, W3BAT 158, W3OZ 115, W3ADO 66, W3HC 43, W3AFF 39, W3CAB 30, W3AHG 22, W3BBW 12, W3PU 5, W3AOO 3.

SOUTHERN NEW JERSEY — Acting SCM, Dr. Luther Mkitarian, W3ASG — Our SCM W3ATJ had to give up the job so he can be 100% ready for the Bar Examinations. W3UW has a new 250 watt 'phone transmitter. W3ASG, W3BPH and W3UJ are active on 'phone work. W3AMP is the call of the Morris Radio Club. W3SM and W3BM report FB DX on 3700 kc. W3BEI is rebuilding. W3JL is recovering from flu. W2CNU is a new Commercial Operator. W3AWV, W3BBD, W3QL and W3JL are new candidates for ORS. The South Jersey Radio Assn., has announced a prize cup for the best all 'round amateur station. The officers of the club are: W3VX, Pres., W3AGZ, Vice-Pres., Rea Simpson, Sec'ty and W3BAY Treasurer. W3BEI is the chief cook in charge of hot dogs!

Traffic: W3SM 607, W3BM 200, W3AWV 21, W3ASG 43, W3ZC 46, W3BPH 21, W3BEI 14, W3UJ 6, W3AHN 6, W3AWT 12, W3ANP 39, W3JI. 82, W3AKV 6, W3ABG 6, W3BBD 75, W3BEX 48, W3QL 193.

EASTERN PENNSYLVANIA — SCM, Don Lusk, W3ZF — I want to take this opportunity to thank those responsible for the Allentown Hamfest. It was certainly put over in a splendid manner. These hamfests are to be twice a year hereafter and the next time we will have larger quarters. I think we owe W3NF and W3GS a vote of thanks for the new "Eastern Penna. Ham News." Let's all work together, fellows, and help put this thing over big. W3ADE can't understand why the 'phone men put it over on the C.W. men. W3DZ was sick and consequently unable to attend the hamfest. W8AWO doesn't know what becomes of time. W3NF QSO'd several G's on 3500 kc. W3MG certainly has a nice bunch of schedules. W3AWB makes another nice report. W8VD is getting ready for the rush. W3GS has a new dynatron frequency meter. W8EU requests cancellation of his ORS temporarily. W3AVI suggests that those who are

unable to find the Frankford Radio Club should just pass a red traffic signal light and the cop will very politely escort you to the Club's quarters, since they are located in a Police Station. W3LC has a pair of type '52s, working. W3ANK has had trouble keeping schedules on 3.5 mc. because of skip DX. W8CWO promises to make the BPL. W3AKB has been laid up with grippe. W3UX complains of QRM on 3500 kc. W3QP is very busy in banking business. Welcome, W8AEF of Sheppton. He is former W9EMT and KFBX. W8DHT is going to try 1750 kc. W3AAD makes application for ORS. W3BES has a new 50 watter. W3FX is a new man. W3AQN has been busy with Navy net work. The SCM is pleased to get a mighty fine letter from W3BDI, who promises to do his part in our big CONTEST. W3ANZ thinks his report is too small to bother. W3EV sends in a nice list of high quality signals and well operated stations. W3GS wants to know how the Ham Bulletin for Eastern Penna. went over with you. Please write him and tell him just what you think of it. W8CFI just hit the BPL this month. W3AIZ has a beautiful signal and a nice fist. W3MC is working England now on 3500 kc. W3DZ is doing active training duty at NAI. W3AQQ is having school QRM. W3OK makes his first report. W3PB is considering crystal. W3OP is building a new AC receiver. W3ZF was away installing a transmitter on a boat which sunk and almost missed making this months report.

Traffic: W3GS 449, W3ZF 329, W3NF 245, W3MG 227, W8CFI 200, W3UX 102, W3EV 101, W3AAD 79, W3ANK 63, W3AKB 63, W8VD 51, W3AWB 46, W3QP 41, W3MC 194, W3AIZ 252, W3PB 12, W3ADE 35, W3FX 29, W8CWO 20, W3BES 18, W3AVI 17, W8AWO 13, W8DHT 11, W3AQN 5, W3ANZ 4, W3AQQ 22, W3LC 65, W3DZ 15, W3OP 30.

WESTERN NEW YORK — SCM, John R. Blum, W8CKC — W8DEQ blew his type '10. W8CKC's mercury arc has gone where all good arcs go after four years of faithful service R.I.P. W8BJO works Spain. The Majority of W8CPC's traffic is with foreigners. W8DSA was under the weather for a few days. W8BFG entered the Sweepstakes contest. W8DII spends most of his time on 3500 kc. W8BLH is doing good OO work. There's a new junior operator at W8BJI — a new kid brother. W8BYD reported late direct to Hqs. W8DBX is to be congratulated on his total. W8BHK was left out of the BPL last month for which we are sorry. W8DEJ makes the BPL. W8BYO and W8CUY are working 6's and 7's on 3500-kc. W8IH is on 1750-kc. 'phone. W8CXH, W8CUY and W8CL are new ORS. W8CXH is working out fine with low powered 'phone. W8BCN is on 14 mc. W8DSS turned in the highest report that has been recorded in this section in years. W8AFM is rebuilding. W8CMW worked DX on 1750-kc. 'phone and QSO'ed W8AHO on 56 mc. The Auburn Navy gang under the leadership of W8DME are getting uniforms and a transmitter. W8BUP has remodeled his outfit. W8CYG has a new crystal outfit. An M.G. for plate supply cannot be beaten says W8QB. W8AFG has schedules with DAIV. W8DHQ is a new ORS. W8BIF is also on with crystal. Some schedules for W8AJ — "ZS," and "G." W8BOX did excellent work during the New Zealand earthquake, having the news in his home city hours before the newspapers. W8DSP wants the gang to know about the big station at Syracuse State Fair next summer. We regret the departure of Dr. Grinnell our R.I. from this district. He leaves many friends among the amateur fraternity, who wish him success and best of luck in his new territory. Mr. Kuning is our new R.I. and we extend to him a hearty welcome and the coöperation of the Western New York district.

Traffic: W8BWY 180, W8DEQ 8, W8AYM 29, W8BJO 21, W8CPC 51, W8DSA 86, W8BFG 21, W8DII 43, W8DJA 3, W8BLH 2, W8BSI 9, W8DBX 227, W8BHK 95, W8DEJ 210, W8BR 19, W8BYO 41, W8CXH 10, W8BCN 4, W8DSS 313, W8AFM 1, W8DME 68, W8BUP 8, W8CYG 16, W8CVJ 4, W8QB 2, W8ADG 6, W8CUY 13, W8DHQ 6, W8BIF 10, W8AJ 17, W8DMS 29, W8DSP 34, W8DES 107, W8BYD 79.

CENTRAL DIVISION

WISCONSIN — SCM, C. N. Crapo, W9VD — W9GFL reports difficulty with his crystal controlled rig. W9FAA has discontinued schedules for a few weeks. W9FAW expects to attend the QSO Party at Milwaukee April 25th. W9FHU wants more traffic. W9DKH is attending the Marquette College of Engineering at Milwaukee. W9EPJ has a new monitor and AC receiver. W9EYH is keeping things moving at Darien. W9ARE has a portable call, W9BFQ. W9FSS took the Commercial Examination, February 21st and 22nd. W9BAS, old 9CCF of Madison, is back with us going strong. W9SO wants schedules with 28 mc. experimenters. W9ESZ is working on a 4 tube crystal controlled transmitter. W9ABM is with us again after giving the fifty watter a year's rest. W9ART is using a P-P TPTG on 3500-kc. We hear from W9BWZ occasionally. W9BIB shows plenty of pep at the QSO Parties. W9EZT will have his type- '04A on 3500 and 700-kc. soon. W9DNE is a new station at Eau Claire. W9VD is busy getting the QSO Party lined up.

Traffic: W9GFL 255, W9FAW 109, W9FHU 103, W9DKH 100, W9EPJ 91, W9EYH 63, W9ARE 52, W9FSS 27, W9BAS 26, W9SO 17, W9ESZ 11, W9ABM 10, W9BWZ 4, W9BIB 2, W9EZT 1, W9FAA 135, W9VD 11.

KENTUCKY — SCM, J. B. Wathen, III, W9BAZ — W9CEE and W9QT make the BPL. W9CDA and W9LH are not far behind. W9OX joins the A.-A. Net. W9ALR says X9-A's receiver must be haywire. W9EDQ reports a new ham, W9FFH, in Ludlow. W9BEW is putting CC to his type '52. W9CNE is now on 3.5 kc. W9ACS gets out well on 3.5 kc. W9ARU left 7 kc. for 14 kc. W9AUH is putting in a type '60 as P. A. W9AIN is now at WFIW, Hopkinsville. W9BAZ hasn't got his type '04As yet. W9EQO is trying to teach the OW to pound brass. W9BAN blew everything in sight, including his nose. W9DDQ is still soaking 'em on 14-kc. W9ERH gets out much better with his 211-D. W9AQV is putting a couple of them push-pull. W9EYW has a 3.5-kc. 'phone. W9FTV is studying hard for the R.I. exams. W9FZV bought a Lizzie. W9GGB is putting in crystal. W9AZY has two transmitters now. W9BZS is on 3.5-kc.

Traffic: W9CEE 240, W9QT 226, W9CDA 134, W9LH 103, W9OX 57, W9ALR 49, W9EDQ 24, W9BEW 22, W9CNE 22, W9ACS 18, W9ARU 17, W9AUH 15, W9BAZ 13, W9AIN 11, W9EQO 10, W9BAN 4, W9DDQ 2, W9ERH 2, W9EYW 2, W9FTV 2, W9FZV 2.

INDIANA — SCM, George Graue, W9BKJ — W9ESU leads the state. W9CVQ runs a close second. W9AUT is now located at Culver. W9AMI is trying hard for commercial ticket. W9DOD moves out of So. Bend as W9BDE moves in. W9DVO spends his spare time cutting iron for chokes. W9CLO is on the air again for the A.R.R.L. Net for the American Legion. W9AHL is struggling to get a DC note. W9CDX is the first Marion station to report in ages. W9EPH has returned from Calif. W9BZZ and W9CMQ are rebuilding. W9FRY is a new station at Richmond. W9FKE worked G1AV on 3.5 mc. 'phone. W9EEH has a low-powered 'phone rig. W9BZZ, W9EEH and W9EWQ are the operators at the Richmond police station, WPDH. W9BNP lost a 211. W9BHM has world-wide DX with his 14 mc. 'phone set. W9DWL is doing well with 'phone. W9DBJ and W9ETH are still trying to make the new HF super perk. W9BWI is making adjustable crystal holders. W9ASJ is using a type '01A since the pet 5 watters went west. W9LQ's feeder wires have taken on a dizzy effect. Activity has slumped at W9FCX since the BCL set moved in. W9CYQ is taking a much needed rest in Florida. W9GJS has schedules on three bands. W9CKG makes the BPL. W9DHJ is working both bands. W9DDB is operating as an Official Broadcast station. W9AXH reports skip distance great but DX greater. W9FYB and W9FTT have joined up with the A.-A. Net W9AIN is now operating at WFIW at Hopkinsville, Ky. W9GGJ is unable to get traffic as in former months. W9FPQ is trying 'phone for a change. W9EKA is getting out fine on very low power. W9AKJ has a new DeForest 552. W9ABW is back again after an absence of two years. W9AIP has finished rebuilding. W9AEB is listed as an ORS again. W9BKJ is busy whittling out crystals. W9AAI's famous line is still heard on 3.5 mc. 'phone. The Indianapolis Radio Club has between 40 and 50 attending the code class, and it looks like a banner season. The Ft. Wayne Radio Club has a club station well under way and will be on the air when license arrives.

Traffic: W9ESU 337, W9CVQ 303, W9CKG 226, W9AMI 116, W9DHJ 107, W9GJS 103, W9DDB 63, W9CVX 57, W9BKJ 38, W9AXH 30, W9FYB 27, W9GGJ 24, W9ASJ 23, W9EFV 21, W9LQ 18, W9FQ 15, W9DSC 12, W9EKA 8, W9AKJ 7, W9ABW 6, W9AIP 4, W9FCX 4, W9AEB 3.

ILLINOIS — SCM, Fred J. Hinds, W9APY — W9GAI has BCL QRM. W9ACE is one of our "Ace" traffic men. W9GFU says traffic can't be given away and no one has any. W9GFU is coaching the Western Electric Radio Club on code, etc. W9DXZ is going strong again. W9FGD has rebuilt the station. W9CNY is out for an ORS. W9BYL

likes his new MOPA. W9CGC says conditions unfavorable this month. W9DBE has a code class at Ill. Bell Telephone Company. W9XAN Standard Frequencies are being heard well on both coasts. W9SI has a type '04A. W9BEP has a type '03A. W9OS, W9BBU and W9CLH all have crystals now. W9DLH is installing a push-pull crystal. W9DZQ has a type '10. W9BXI gets out fine. W9DVK has a crystal. W9GIN and W9AAY are new stations. W9DZG has new transmitters for three different bands. W9BLL is installing crystal. YLs are being trained by W9ADZ and W9END. W9CMC still has hopes for the OW. Hi. W9DZU built a new 3500 kc. type '10 outfit and hooked New Zealand and Peru. W9BVV is on 3500 kc. early in mornings. W9DKF plays checkers over 'phone with locals. W9EAL has a new MOPA. W9FRA has two type '71As in parallel. DX and QRM are picking up at W9ET. A brand new pole is up at W9ENH. W9ADN and W9GV are running a race to see which can work the most VKs. W9ADN was heard long way around in Australia. W9ERU has a surprise for the neighbors — two brand new type '52s with 2200 volts. Hi. W9BNO is building a new receiver. W9FFQ, W9AIC, W9BNO and W9ERU are getting DX. W9DGK was in on Transcons. W9BRX is building the new crystal transmitter. There's a new antenna at W9DWP. W9BZO is trying out the 14 mc. band for a change. W9GV has 7 mc. schedule with VK6MO. W9CUH is building up a crystal outfit. W9KB likes 3500 kc. W9ACU is moving into his own home. W9FCW is doing nicely with Official Broadcasts. W9BRY says the boys in Rockford hid under the bed — the R.I. paid a visit. W9CUK has a Push-Pull on 3500 kc. New Commercial Sheepskin at W9GIV. W9GJJ is proud owner of Extra First Amateur Ticket. W9CKZ is on again after an illness. W9CGW, W9DEV and W9DXK are all new stations at Waukegan. W9AFB has moved. W9FPN tried 'phone. W9DZM is our star traffic man, as usual. Television is being installed at W9FZW. W9CUX is rebuilding. W9FO handled accident messages with HK1AA in Bogota. W9PK has a type '52 in a new Hartley. W9ENQ and W9BNR had a QSO lasting for seven hours and fifty-five minutes. W9BNR has C.W. and 'phone on 1712 kc. W9BIR is learning Morse. Does anyone know how W9AFN can QSO Asia? Single wire antenna is in use on 3500 kc. at W9EMN. W9LL has a new MOPA. W9QI wouldn't sell the S-G for $100. Hi. DX is improving at W9BVP. Receiver trouble again at W9CKM. W9BSR is on 3500 kc. with a 7000 kc. Zepp. New a.c. receiver is working at W9CF.

Traffic: W9DZM 615, W9AMO 117, W9AFN 105, W9ERU 103, W9FGD 97, W9DXZ 74, W9LL 66, W9COB 60, W9ET 46, W9ACE 44, W9FI 39, W9BIR 37, W9BYL 36, W9BVV 36, W9BNR 35, W9BLL 33, W9DBE 31, W9AD 30, W9END 28, W9CNY 24, W9AFB 21, W9CGC 21, W9DKF 21, W9ADN 20, W9EBX 20, W9APY 19, W9DZG 19, W9GAI 18, W9FPN 16, W9CF 15, W9FZW 15, W9BNI 11, W9PK 11, W9QI 11, W9FO 10, W9MI 10, W9ACU 9, W9FVO 9, W9WJ 9, W9GIN 8, W9GJJ 8, W9KB 8, W9BPN 7, W9BSR 6, W9DJG 6, W9EMN 6, W9FTX 6, W9KA 6, W9CKZ 5, W9CUX 5, W9ANQ 4, W9BRY 4, W9CKM 4, W9BVP 3, W9FCW 3, W9CMC 2, W9CUK 2, W9GIV 2, W9DGK 1, W9FRA 1, W9GFU 1.

OHIO — SCM, Harry A. Tummonds, W8BAH — The three musketeers are still in the BPL: W8GZ, W8CMB and W8BGX: also W8DDS. Our message total is 3223 this month. W8DDS is the new N. Ohio RM. W8BZB reports no number on his certificate. W8BKM reports new hams, W8DWH and W8DHP. We are glad to hear from W8CNO again this month. W8BDU renewed his league membership. W8CWC said he was coming to Cleveland. W8AXV, RM 7000-kc. band, has a new transmitter. W8ATV has been on 'phone. W8EQ is reporting now. W8UW is active in American Legion Net. W8DU, RM S. Ohio 3500 kc. band, is lining up American Legion Net. Traffic not bad at W8ADS. W8CCK bought a gas station. W8VP is a new ORS at Cambridge. W8CNM took the Exam. for a commercial ticket. W8BAH visited the gang in Youngstown Feb. 14. W8NP reports good schedules. W8MH is trying to get a Sweepstakes tag. Marietta will soon have some new hams, reports W8TK. We want news and reports from Ohio Radio clubs. W8DPF is doing good work at Sulphur Springs. W8DMX is active on AARS schedules. W8EJ changed to two type '10s in push-pull. W8CEI has been heard in NZ. W8CSB has new transmitter on 1750 kc. W8CIY handled some California traffic. W8AOJ is a new Cleveland reporter. W8CUL reports a new ham, W8EDY, formerly W8BIN. W8US is active in U.S.N.R. net. W8BAC is busy at school. W8DFR, a new reporter at Canton, offers 100 QSL cards for the highest total each month. W8ARW reports. W8AGC is a new Cleveland reporter. W8CSS has moved to 1025 Third St., Marietta. W8DMK is a new reporter in Youngstown. W8FA is a new ORS. W8BNC is another new Cleveland reporter. W8CK worked 96 stations with a type '12A. W8CGS is using a Hertz per article in Dec. 1930 *QST*. W8BMX relayed some West Coast traffic. W8OQ reports a new ham, W8AFU. W8LI worked F8ED on 14 mc. W8DBK got W8DSN a date by radio when he was at the key at W8LT. W8DUD worked four continents in 8 hours. W8BYG is putting a transmitter on the 3500-kc. band. W8CWA reports. W8RN is having trouble with his MOPA. W8CX ordered his school books by radio. W8BF reports. W8BBH reports he is rebuilding. W8APC has finished MOPA. W8BCF and W8HH report. W8DGT is a new reporter at Lancaster. W8CWP will soon be back on the air. W8AKA is building a new receiver. W8BCI says his guaranteed blocking condensers went west. Welcome to Ohio, W6EVA (YL) and W6RM (OM), Mr. and Mrs. Don C. McRae new reporters, now at 26 Wilson St., Columbus. Another new reporter is W8EAV in Cleveland; also W8EEP. W8EEQ of Findlay applies for ORS. Let's be original and originate some traffic.

Traffic: W8GZ 479, W8CMB 359, W8BGX 325, W8DDS 305, W8BZB 138, W8BKM 131, W8CNO 121, W8BDU 120, W8CWC 88, W8ATV 84, W8UW 78, W8ADS 63, W8CCK 62, W8VP 55, W8CNM 54, W8BAH 51, W8NP 47, W8MH 46, W8DU 46, W8TK 43, W8EQ 42, W8DPF 41, W8DMX 36, W8EJ 42, W8CEI 33, W8CSB 30, W8AXV 27, W8CIY 26, W8AOJ 24, W8CUL 24, W8US 21, W8BAC 16, W8ARW 14, W8DFR 14, W8AGC 13, W8CSS 13, W8DMK 13, W8BNC 10, W8CK 10, W8FA 10, W8CGS 13, W8BMX 9, W8OQ 8, W8LI 6, W8DBK 6, W8DUD 5, W8BYG 5, W8CWA 4, W8RN 3, W8CX 3, W8BF 3, W8BBH 2, W8APC 2.

MICHIGAN — SCM, R. J. Stephenson, W8DMS — Well, gang, Steve is playing sick, so W8FX, W8DZ and W8DYH are doing the work this month. W8COQ works at WASH. W8DXY, W8CAT, W8BDI, W9EQV and W8OV are good reasons for an SCM to go "west" — Tfc, but no dirt! W8BTK led the march this time! W8DLX says W8DAQ is also on the sick list. W8GP put in a panel job. W8SS sends his "drop" for the bucket. W8AF and W8OV are QRU on the dope. W8DCT does his work Monday nights. W8DNT is still running Code Practise. W8CFZ, W8CWK, W8CLL and W8AE are all building. W8AM is going to make an MOPA. W8DEH works W6 and W7 on 3.5 with a type '71! W8BGY is a good marker for 7 mc-3649 and 7298. W8BBX wants OO job. W8DED is now in the printing business. W9GJX could only be on half of the month. W8DDO put crystal. W8BMZ sends in his first report. W9AXE is making hams out of BCLs. W8MV — Ford out of hock — Nil. W8CU *eventually* keeps his promises. W8PP worked HK1AA. W8FX — can't print the dirt. W8DZ will have a new operator-sister-watch the traffic fly! W8DYH, code practise engineer, is QRL. W8BWJ has a type '10 in TPTG on 14 mc. W8WG is getting crystalitis. W8DFE will have a 50 going soon. W8JX wants schedules about 10 a.m. W8COW has a new stick. W8JH needs help putting up an antenna. W9HK, the pep of the UP, is doing things in a large way. W8AKN is organizing "The Royal Order of the Battered Vacuum-sweeper." Says W8BMG, "A sked, like a secret, is something nobody keeps!" — hi. W8BJ proposed for a fellow; she accepted — amateur radio scores again! W8IJ reports but does not give 'em in itemized form so "no can list." W8DJQ is QRL with a new Radio-Writer. W8SH — 250 watts — W8AUB at key. Mr. Ritchie, of Lighthouse Svc., Dept. of Commerce, gave an interesting talk on radio, as used in the service, at the last meeting of the D.A.R.A. W9FPF keeps one schedule. W9GKR is rebuilding. W9CSI handles a few. W8BRS sends in an unprintable report. W8RP is still doing big business. W9EGF reports W9DPQ, a new ham. W8DET only needs VK, PY, AC, G, SU and W for a WAC! W9CE works three bands. W8CJK wants a Teleplex with Morse tapes. Watch for W8BIN at the Radio Booth at the Detroit Aircraft Show. W8IJ is working out well with crystal.

Traffic: W8BTK 240, W9HK 238, W8DYH 229, W9CE 205, W8BMG 128, W8BJ 112, W8DXY 102, W8DMS 95, W8AM 92, W8DEH 84, W8BGY 65, W8CWK 63, W8BBX 54, W8DED 53, W9CJX 51, W8CAT 47, W8DDO 47, W9FPF 47, W8CLL 40, W8JX 34, W8DFE 32, W8WG 30, W9CSI 28, W8BWJ 26, W8FX 26, W8PP 24, W8CU 22, W8BDI 19, W9EQV 19, W8MV 18, W9AXE 18, W8BMZ 16, W8CFZ 16, W8COQ 16, W8DCT 13, W8AF 12, W8SS

12, W8DLX 10, W8OV 9, W8TJ 9, W8DNT 6, W8AE 4, W8DET 4, W8GP 4, W9EGF 4, W8BRS 2, W8RP 1, W8LJ 18.

DAKOTA DIVISION

NORTH DAKOTA — SCM, Guy L. Ottinger, W9BVF — W9DGS got 99 points in the A.-A. QSO party. W9DM has at last got the set perking. W9DOY reports that they have a new ham, W9GIZ, at WDAY in Fargo. 1750 kc. still gets some support from No. Dak., W9DYA and W9FMC being active there. DX is picking up at W9EGI. W9CRL is picking up some traffic. W9BVF has been on quite a bit. Let's give the new RM, W9DGS, a little support.

Traffic: W9DGS 213, W9BVF 102, W9CRL 97, W9EGI 13, W9DM 4, W9DOY 1.

NORTHERN MINNESOTA — SCM, Ray H. Weihe, W9CTW — Write W9DOQ, your RM, for schedules. The Duluth Junior College station, W9YK, has a real staff of operators. W9EGU has rebuilt to crystal control for all bands and 'phone. W9CWI, our OO, plays checkers via radio. W9EOZ has a new AC receiver. W9EHI reports the new Naval Reserve station at Duluth, W9FAC. W9ADS says "Cherrio." Hi. W9FAQ is a new ORS, as is W9FNJ. W9GKM applied for ORS. W9AAN is a teacher. W9DJW reports conditions better on 14 mc. W9BVM is a new ham in St. Paul. The Northern Minnesota Section boasts of one of the best Radio Clubs in the country, the Arrowhead Radio Amateurs Club of Duluth and vicinity.

Traffic: W9YK 65, W9EGU 56, W9CWI 43, W9EOZ 35, W9EHI 22, W9FNJ 22, W9CTW 16, W9GKM 11, W9ADS 10, W9DOQ 8, W9FAQ 5, W9GGQ 5, W9AAN 4, W9DJW 3.

SOUTHERN MINNESOTA — SCM, H. Radloff, W9AIR — W9BN enjoyed the Army-Amateur QSO Party. W9BNN is creeping nearer the top. W9COS missed BPL for first time in months. W9EFK has a push-pull AC screen grid detector. W9BKX also enjoyed ZZF night. W9FFY sends in a newsy report. W9DRG hooked a little DX. W9DGE reports another string of visitors. W9CKU gets a beaut of a note from his type '66s. W9EYS still makes his type '01A perform. W9GHO and W9FFE exchange coils as needed for QSV. Bob Brooke reports W9CH now replaces his former call, W9DSH. W9FNK reported late last month so has two this time. W9FJK was QSO W6AM and reports Don says "Give my 73 to the gang in my old home town." W9EFJ lists his traffic and reports on W9YC. W9FLE built a new super transmitter. W9AIR wants an AC converter. ExW9EPE is now W9TF. W9EOH is considering crystal control. W9EAT has his new 'phone set perking. W9FAD on 1.7 mc. 'phone gets good range. He was also heard in Australia on 3.5 mc., as was W9FLE. W9AKN hooked ZS5U, his first African. W9DHP popped his filter condensers. W9GGA is said to be getting 'phone fever. W9EAH is on once in a while. W9DBC and W9BHB still enjoy radio checkers. Bob and Bill hooked quite a bit of DX from W9CPM. W9FMB reports the S F transmissions logged FB. W9EYL reports DX conditions on 14 mc. not so hot lately. W9FAE and W9CRQ are on 3.5 mc. 'phone. W9QE is heard keeping schedule with W9CYA on 3.5 mc. W9EEB uses new coil forms.

Traffic: W9BN 149, W9BNN 136, W9COS 130, W9AIR 105, W9EFK 1, W9BKX 80, W9FFY 75, W9DRG 67, W9DGE 40, W9CKU 31, W9EYS 15, W9CHO 11, W9DSH 18, W9FNK 6, W9FJK 5, W9EFJ 2, W9FLE 1, W9AKN 2. W9FNK 46 (December-January).

DELTA DIVISION

TENNESSEE — SCM, James B. Witt, W4SP — W4RP is still way out in front. W4AAD is the first 'phone station to send in traffic report. He has worked all districts on 'phone within a two hour period. W4OI is building a crystal controlled transmitter. W4GX suggests that we put on a contest to see who can handle the largest amount of traffic and give a type '10 as the prize. What do you say to this, gang? We have three new stations, W4APO and W4AOI in Bristol, and W4ANM in Kingsport. W4HG, old W4ABZ, is back on the air.

Traffic: W4RP 288, W4GX 98, W4AFS 56, W4SP 39, W4AAD 32, W4OI 27, W4FR 26, W4AAO 23, W4ABQ 7, W4AHR 6, W4AFM 5, W4FX 4, W4KJ 3, W4RO 21.

ARKANSAS — SCM, Henry E. Velte, W5ABI — As usual, our BANNER STATION is W5BMI. W5IQ has five schedules. W5HN is on both c.w. and 'phone. W5RW is getting out well on 7 and 14 mc. W5BPE is installing a new power supply. W5BRI has been on 3.5 mc. mostly. He led the 7th Corps Area in the recent A-A QSO party. W5BLG has gone to 3.5 mc. c.w. W5ABI has given up 'phone and gone back to c.w. W5LV has also given up 'phone. W5SI hands in a nice traffic total. W5BTT is still on 3.5 mc. 'phone with low power. W5BDB is building a 75 watt MOPA. W5BSL at Fordyce lost most of his equipment in a fire.

Traffic: W5BMI 300, W5IQ 104, W5ABI 84, W5HN 73, W5SI 56, W5RW 18, W5BPE 18, W5LV 17, W5BRI 14, W5BLG 4, W5BTT 4.

LOUISIANA — SCM, F. M. Watts, Jr., W5WF — W5MH reports that his new QRA is Patterson. W5AFE is getting things lined up again. W5RR is still going strong. W5BJA is still off on account of YL QRM. W5NJ is remodeling and says that he will have a PDC note. W5ACY says the coke business is rushing. That means less traffic. KO Sam. W5BDJ reports W5ARL is a new man on 7 mc. W5WG is knocking a hole in the ether. W5BHV has a bug that makes six dots where four is intended. Where are W5ANQ, W5AXD, W5AXQ, and all the rest of the gang who do not report? W5YW is going good now. The Division Director, Mr. M. M. Hill, visited the New Orleans gang and they had a hamfest. W5ABS, W5BPL, W5QJ, W5HR and W5EB made the attendance. W5WF is all set to win Sweepstakes. The Bayou State Radio Club was recently organized at Baton Rouge, La. W5BDU is the club station call and they have a 100 Watt Transmitter on the 7 mc. band.

Traffic: W5WF 527, W5EB 175, W5YW 98, W5ACY 30, W5NJ 19, W5ANA 8, W5RR 7.

MISSISSIPPI — SCM, William G. Bodker, W5AZV — I want to thank every A.R.R.L. member who had a hand in electing me to the position of SCM and hope that with your support this section can be made a real one. W5APP is handling quite a bit of traffic on 7000 kc. W5ANI is having trouble with low line voltage. W5AMP and W5AUF are new stations in Jackson. W5AZV has a new MOPA on 7000 kc. W5BBX is crashing out with his 50 watter on 7000 kc. W5BHL has QRM from his BCL repair business. W5BNW is well pleased with results on 14,000 kc. W5BOT wants to know how to make his new 7000 kc. TNT get out of the back yard. W5BUI has applied for an ORS. W5VJ has a new 3500-kc. push-pull. The Jackson Amateur Radio Association, composed of the active Amateurs of Jackson, Miss., was organized in May 1930 and has been functioning ever since. The clubroom is located at 501 Century Bldg., Jackson. The officers are W5AZV, President, W5BHL, Vice-President, W5VJ, Secretary and W5BNW, Treasurer. Meetings are held every Saturday night. The club recently made a camping trip to the local Boy Scout camp, taking along a portable 3500-kc. transmitter using a single type '10 tube and Hertz single wire feed antenna with a dynamotor for power supply. Stations all over the U.S. were contacted as well as stations in Jackson. A good time was had by all.

Traffic: W5AZV 88, W5BUI 56, W5APP 21, W5BNW 14, W5BOT 11, W5VJ 7.

HUDSON DIVISION

NORTHERN NEW JERSEY — SCM, A. G. Wester, Jr., W2WR — W2WR is back on the air with crystal control on 7140 kc. W2JF has six schedules a week with W1CJD. W2AOS spent all his time on active duty with the U.S.N.R. W2CWK worked hard in the Sweepstakes. W2AGX is getting to all corners of the world on 14 mc. W2CJX was laid up with a touch of pneumonia. W2AMR was QSO Hungary on 7 mc. W2DV is working fine DX on 3.5 mc. W2BPY is devoting most of his time to traffic. W2MQ leads the section again this month. W2CFY expects to have two transmitters going for the tests. W2CEX's ambition is to make the BPL. W2AIF and W2CDQ have been appointed ORS. W2CLX is getting disgusted with conditions on 3.5 mc. W2AQM, the Ridgewood High School station, is now on the air again. W2CHZ had a fine total for a non-ORS. W2CPA had the misfortune of losing a type '81. W2BYX sent in his initial report. W2BJZ cured his troubles on 14 mc. and is now stepping out. W2CRD is another initial reporter, who just got his ticket. W2AUP is still operating on the 7 mc. band. W2CDQ makes the BPL on deliveries. W2AQI is new ham in Glen Rock. W2ASH, W2AGN and W2AGO are new stations in Ridgewood.

Traffic: W2JF 48, W2AOS 45, W2CWK 12, W2CJX 6, W2AMR 29, W2DV 40, W2BPY 22, W2MQ 57, W2CFY 2, W2CEX 23, W2BHW 14, W2CLX 6, W2CHZ 24, W2CPA 3, W2BYX 6, W2BJZ 1, W2CRF 2, W2AUP 21, W2CDQ 99.

NEW YORK CITY AND LONG ISLAND — Acting SCM, Wm. J. Warringer, W2BPQ — W2BGO will be back on the the job next month. Manhattan: Once again W2SC

leads the Section. W2BXW is having trouble getting his license renewed. W2BDJ is knocking them dead on 7 mc. W2BBY applied for ORS. W2BNL is overworked by NBC. W2BZN is sold on MOPA. W2AVK says it won't be long now. W2AOU is a new ham from Alabam. Brooklyn: W2APK reports one Miuzzelini QSO'ed. W2PF reports W2CHU is in Borneo Dutch East Indies using calls PK6CH and PK7CH. W2BIV is organizing coast to coast chain. W2BO sent report on his FB QSL card. W2BEV promises to do better. W2LB wants men for Naval Reserve. W2AZV was on active duty with Reserve at Navy Yard. Bronx: W2AQG has junked his crystal rig. W2CYX schedules VO8AW twice a week. Give W2LW upper N. Y. State traffic. W2BPQ is getting thin running this job. W2VG has fallen in love with 3500 kc. Long Island: Official Observer W2AIQ is devoting his time to off frequency 'phones. W2US is doing excellent work as OO. W2AVP is making ham out of BCL — W2AKL is his call. W2HO wants to be an ORS. Ditto W2BDN. W2CHY is looking for that traffic the rest of the Section says it can't relay to Long Island.

Traffic: Manhattan — W2SC 211, W2BXW 43, W2BDJ 31, W2BBY 8, W2BNL 2, W2BZN 2. Brooklyn — W2APK 60, W2PF 48, W2BIV 37, W2BO 20, W2BEV 18, W2LB 8. Bronx — W2AQG 63, W2CYX 57, W2BPQ 23, W2LW 23, W2VG 3. Long Island — W2AIQ 50, W2AVP 38, W2HO 11, W2BDN 6.

EASTERN NEW YORK — SCM, H. J. Rosenthal, W2QU — The Pioneer Radio Club is now using only crystal controlled transmitters. W2LU leads the district in traffic and reports the arrival of a new junior operator at his home. W2BJA is working up a Delaware Hudson RR route. W2CJP is organizing a police net covering the entire state and is looking for a good station in New York City to complete the route. W2CBB found plenty of traffic. W2UL has applied for an ORS appointment. W2ACB is traveling around the state meeting many of the Hams he has worked. W2OP found only enough spare time to keep up his Army schedules. W2BAI reports passing all his school exams. W2CL and W2ZC attended the Hamfest given by the Lehigh Valley Amateur Radio Club. W2AJD has been busy as Official Observer. W2ALI reports a new YL in Poughkeepsie under the call of W2AYF. W2ACY used his high frequency receiver to let his friends listen in to the Vatican Broadcast direct from Rome. W2QU, W2UL, W2AYK, W2BC, W2AYZ, W2BSD and W2CFU are spending ten days' active duty with the Naval Reserve.

Traffic: W2LU 232, W2BJA 125, W2CJP 47, W2CBB 35, W2UL 20, W2ACB 15, W2OP 12, W2BAI 11, W2CL 9, W2AJD 15, W2ALI 7.

MIDWEST DIVISION

MISSOURI — SCM, L. B. Laizure, W9RR — St. Louis: W9ECI led in traffic, W9PW second and W9DZN third. W9DZN joined the AA net. W9PW kept East Coast and U.S.N.R. schedules. W9AMR reported from Nashville, Tenn. W9ECI kept six schedules. Prize bet on sweepstakes contest — W9ECI bet W1RV a pair of burnt out type '81s against a 1924 call book he would have the higher score. W9ZK handled some traffic. W9FTA is the new RM. W9DYJ sends a list of bum signals and good ones. W9FFJ was handling a lot of contest messages. Kansas City: W9BMA led in traffic with W9BMT second. W9BMA drew an OBS ticket. W9AKZ reports night school is bad on traffic handlers. W9AOG reports school QRM. W9CFL kept up the U.S.N.R. schedules. W9DLL is QRL with crystal grinding and 14 mc. 'phone. W9RR spent some time on U.S.N.R. recruiting trips. General: W9BJA sends in a long report on off-band operation. W9AIJ is teaching hams the code at Marceline. W9FSL is one of his students who just received license. W9BGN reports for St. Joseph. W9DHN reports FB on 1750 kc. W9CDU radioed report via W9BMA. W9CJB reported a lot of schedules. W9BGW is busy rebuilding. W9FVM is organizing a U.S.N.R. unit at Monett. W9GAR is giving 1750 kc. a trial. W9GBA received his ORS. W9ATX's report got in the wrong pile. QRA is St. Louis. W9ENF is still on the shelf recovering from auto crash. W9ASV radios a report via W9BMT. W9DCD remembered the SCM with a long squib of news and report. The SCM continues to hear comments (?) about his getting into print by holding a QSO with W5AJR at the time W5AJR was hit by an earthquake that chased him out of the house. That's easy, as the SCM has QSPd lightning to California during a QSO, and has participated in hunting snipe by radio. Next! Reports have it that a ham convention will be held by the SMARA in Rolla, Mo., next fall; dope from W9EYG, president of the SMARA. Get in line everybody. W9EPX reports news of Columbia. W9ERM is now operator at RXC, Panama commercial station.

Traffic: W9PW 71, W9DZN 67, W9ECI 166, W9ZK 13, W9FTA 18, W9DYJ 15, W9FFJ 19, W9BJA 283, W9DCD 103, W9BGN 26, W9DHN 95, W9CDU 34, W9CJB 76, W9BGW 50, W9FVM 29, W9GAR 20, W9GBA 1, W9ASV 20, W9BMA 270, W9BMT 123, W9AKZ 44, W9AOG 7, W9CFL 201, W9RR 91.

IOWA — SCM, H. W. Kerr, W9DZW — Another evidence of schedules in W9EJQ's high total this month. W9BGI, who controlled a 1 kw. spark in '21 is on the air at Eagle Grove. W9ANO is a new station in Eagle Grove. W9ACL upholds Eastern Iowa's reputation with a nice total. W9DJX is a new ham. W9FLK is QRL radio shop. W9BYJ is a new ham in his town. W9DTM kicks in with a live report. W9FZO had a visit from W9ASI. W9FFD's OW spent time in the hospital. W9BCA is getting interested in U.S.N.R. stuff. W9BPG is out for ORS. W9EIV is entitled to ORS now. W9BFL has been rebuilding. W9FYC radios a report. W9EHR transfers his activities to W9AG, his Ottumwa station. Thanks to W9AHX for report. W9AWY lost his crystal. W9DNZ puts his report thru on AA schedules. Never mind the "bad luck" W9BJP, we all have some of it. W9GDG joins the Chicago crowd, to assume duties as musical director at WBBM. W9FRR is a new call at Irwin. W9DIB wants to know if "we fellows who are not ORS can report." Sure, that's the way they get to be ORS. Many of the AA and traffic men are going to 1715 kc. Plans are in the making for the Short Course and Midwest Convention for Iowa at Ames, May 8 and 9th during the State College Veisha Week.

Traffic: W9EJQ 455, W9ACL 230, W9DZW 108, W9FLK 87, W9DTM 80, W9FZO 63, W9FFD 62, W9BCA 61, W9BPG 59, W9EIV 29, W9BFL 18, W9FYC 12, W9AG 7, W9AHX 6, W9AWY 5, W9DNZ 3, W9BJP 2.

NEBRASKA — SCM, S. C. Wallace, W9FAM — W9BOQ carries off the traffic honors again. W9FAM's license expired and renewal not yet received. W9BHN is coming to the front. W9DFR is going strong. W9EEW's rest day is changed to Monday. W9EHW is keeping a nice bunch of schedules. W9CPJ, the RM, is being kept very QRL. W9BQR manages to be on for schedules. W9DTH says let's all be at that convention at Grand Island, March 21st. W9BBS needs something to do. W9DI is interested in the boosting of Nebraska. W9DFF is located at West Fargo, No. Dak., Opr. for WDAY. W9CHB is editing "THE NEBRASKA HAMS" and lining things up for the Convention at Grand Island, March 21st. W9BNT turns in a nice total. W9EGC says he is going to join ORS soon. W9EGJ, W9EDI and W9GKZ report. W9DZK handled 33. W9DHC is rearing to go.

Traffic: W9BOQ 137, W9FAM 112, W9BHN 108, W9DFR 41, W9EEW 30, W9EHW 29, W9CPJ 16, W9BQR 4, W9DTH 4, W9BBS 32, W9BNT 155, W9EGC 50, W9EGJ 46, W9DZK 33, W9EDI 11, W9DHC 49, W9GKZ 14.

NEW ENGLAND DIVISION

NEW HAMPSHIRE — SCM, V. W. Hodge, W1ATJ — W1APK is using a new 'phone transmitter and wants the gang to listen to the Official Broadcasts. W1IP makes the BPL. W1BVE is new ham in Manchester. W1BFT is trying 'phone. The White Mt. Radio Club has been formed in Gorham, with eight active members. W1ANP is President. W1UN is on daily. W1AEU is on with a type '52. W1BJF is on 3500 kc. with a new MOPA. W1ANS is using a push-pull rig with type '10s. W1AFD has been laid up with a broken knee. W1AWU did some DXing. W1BAC is trying 7 and 14 mc. W1BRG is a new station in West Lebanon. W1CAF is using a type '52. W1BOR is building MOPA. W1AVG's XYL is on with 'phone. W1CCM is keeping schedules on 3740 kc. W1AVD is on in Lancaster with a type '10. W1BLA is getting started in East Rochester. The SCM is back on 3500 kc. with crystal.

Traffic: W1AWU 345, W1IP 338, W1BAC 174, W1BJF 108, W1UN 53, W1APK 32, W1CAF 32, W1CCM 18, W1BFT 14, W1ATJ 27.

VERMONT — SCM, Clayton Paulette, W1IT — W1ATF leads the state in traffic. W1BD is our next highest traffic man. W1CGX was tied up for a week awaiting return of his license. W1BJP has been busy with the refrigeration game. W1ATZ reports two new stations, W1AAK and W1BRG. W1AXN, Richmond, is on the air with a type '10 on 3750 kc. Another new station in St. Johnsbury, W1BNS, is on 3500 kc.

Traffic: W1ATF 319, W1BD 224, W1CGX 162, W1BJP 51, W1IT 29, W1AXN 4.

WESTERN MASSACHUSETTS — SCM, Leo R. Peloquin, W1JV — On Feb. 21, about 15 members of the Springfield Radio Ass'n paid a return visit to the Worcester Radio Ass'n. The meeting was opened by the President of the Worcester Club, Mr. Leo R. Peloquin. In the absence of the President of the Springfield Club, Mr. Percy Noble, Mr. Harry Fisk, Vice-President, gave a most interesting talk. The following speakers were next in order, Mr. C. W. Sias, Mr. I. Creaser, Mr. C. J. Green, Dr. Tessmer, Mr. E. G. Hewinson. The guest of honor for the evening was next introduced, Mr. Frederick Best, Director of N. E., A.R.R.L. and Section Commanding Officer from Maine U.S.N.R. Mr. Best spoke of the importance of Amateurs working together and complimented both Associations for their initiative in sponsoring Ham-fests of this kind. Refreshments were served, followed by five reels of entertaining movies. The meeting adjourned at midnight. W1ASY makes the BPL. W1BIV has a new YL. Two new ORS this month, W1AIF and W1ATK. W1ZB is keeping two schedules a week with W1MK. W1NS and W1CTF have joined the U.S.N.R. W1ZAC is back on the air. W1APL has two new schedules. We had a 100% ORS report this month. FB. The SCM hopes to meet all the boys at the N.E. Convention at Boston April 24-25th.

Traffic: W1ASY 237, W1AIF 118, W1APL 101, W1JV 77, W1BNL 64, W1BVR 62, W1NS 61, W1CPG 30, W1ZB 27, W1ATK 18, W1ASU 17, W1AJD 17, W1AMI 9, W1BIV 6, W1BRD 6.

EASTERN MASSACHUSETTS — SCM, Miles W. Weeks, W1WV — W1ASF distinguishes himself by making BPL and also working an enormous amount of DX. W1LM makes BPL with the high total for the Section. W1ACD and W1ME are now ORS. W1ACD was QSO DAIV. W1AAT worked the West Coast and G5BY on 3500-kc. W1LQ had a good score. W1WV was QSO 5 continents and added 5 new countries, including VQ4CRF in Kenya. W1KH has a new 4 tube Automatic Tuner Hull receiver. W1BIY-W2ANZ reports. W1CHR is keeping a lot of 3500-kc. schedules. W1WU is using a 50 watter. Marriage QRM cut down W1ABG's traffic. W1AFP is looking for more and better schedules on 3500 kc. W1CQN is using two type '10s in his P.P. Xmtr now. W1AVA will soon have his ORS. W1BXB has moved to new QRA. Sickness kept down W1ANK's total. W1ATX is on 7000 and 3500 kc. W1BDF reports for the first time. W1BZQ is still rebuilding. W1CCP has an additional call now, W1BSE. W1CAW is using 'phone on 3500 kc. W1KY reports. W1ACH continues his schedules with W1MK and W1LM. W1AZE was QRL business this month. W1ADK has rebuilt his transmitter and can QSY three bands quickly with plug-in coils. W1AAL is doing some DX on 7000 kc. W1CDJ, exW1CRA, has been QSO Europe on 7000 kc. around 0100 GMT. Don't forget the New England Division Convention, April 24 and 25, at Boston.

Traffic: W1LM 203, W1LQ 171, W1WV 154, W1AVA 104, W1ASF 100, W1CHR 91, W1ACH 75, W1KH 68, W1ATX 38, W1AFP 36, W1BZQ 34, W1ME 32, W1AAT 29, W1CAW 24, W1ACD 24, W1ASI 24, W1ADK 19, W1CCP 18, W1AAL 15, W1ABG 14, W1BGW 12, W1AZE 10, W1CQN 9, W1ANK 5, W1BDF 5, W1BIY 5, W1BXB 4, W1WU 2.

MAINE — SCM, G. C. Brown, W1AQL — The Queen City gang enjoyed a fine buffet lunch at the Club on Friday evening, Feb. 20. W1AIH gave a very interesting talk on his experiences in the amateur game from the old spark days up to the present era. The broadcasts, on the A.R.R.L., from station WLBZ, are still going over FB. W1ATO is high man this month. W1AFA sends in a fine total. W1CDX reports good DX. W1ACW says his OW is using his antenna to hang socks on and that is why he has such a kick. Hi. W1BLI reports being off the air due to illness. W1BEU reports six active stations in Waterville. W1QH says his shack has been too cold to handle much traffic in. W1CEQ and W1BWB report for the first time. Two old timers send in their reports this month, W1VF and W1EF. W1BGZ thinks that 3500 kc. is the coming frequency. W1BIG is on his annual cruise at the Boston Navy Yard. W1BFZ reports the call letters W1CEM as being assigned to Headquarters Company, 152nd Field Art. National Guard. W1BFA signed up with the Navy Net. W1BEZ reports working F8LGB on 3500 kc. W1FQ has reconstructed his transmitter. W1AHY reports that school faculty work prevented any traffic work.

Traffic: W1ATO 193, W1AFA 117, W1CDX 58, W1ACW 52, W1BLI 45, W1BEU 36, W1QH 35, W1CEQ 29, W1EF 27, W1BGZ 16, W1BWB 12, W1VF 8, W1KQ 8, W1BFZ 6, W1AQL 25, W1BFA 7.

RHODE ISLAND — SCM, N. H. Miller, W1AWE — W1TQ is still busy at WLSI, as is W1BES. W1AMJ keeps the BCL's happy through his service. W1ATM is heard on 3500 kc. W1OU is just recovering from his illness. W1BML is busy at WJAR. W1ALD was seen plenty with his YL. W1II says DX is punk. W1QR is high man this month. W1BCR has had plenty of trouble with the BCLs so operating hours and power are now cut down. W1BBA is heard on 7 mc. W1EJ is Vice-President of the A.R.A.S.N.E. W1CLZ is a new ham in Providence. W1MO has a new National A. C. S. W. receiver. W1AWE is working out FB on 7150 kc. W1ID has a nice 'phone on 3500 kc. W1CAB is heard Tuesday nights pounding out his Navy stuff. W1AUV still fixes up the BCLs. W1ASZ reports as President of the Pawtucket Senior High Radio Club, W1BTP. W1ABO is on 1750 kc. giving the BCL's code practise. W1AMU is back on the air. W1CPV is looking for traffic. W1AMD-W1DZ is at WJAR. W1BIW just finished moving. W1AAD is tied with W1BGA in the local DX contest. W1BOP is an operator at WJAR. W1DW is an old timer with a new call. W1BQD is going full blast again. W1AGJ is inactive so far as ham radio goes. W1BLV is on 3500 kc. W1CPV has a schedule with Maine. W1ARK has the bug again. The Pawtucket Senior High School Radio Club has just been organized. W1ASZ is President and W1CQG is Secretary. The club just got on the air with the call, W1BTP. All communications should be sent to W1BTP at Pawtucket Senior High School. The Associated Radio Amateurs of Southern New England recently held their election, the following officers being elected — President, W1II-W1ZS; Vice-President, W1EJ; Treasurer, V. E. O'Neill; Secretary, W1BIW; Publicity, W1AWE. The club call W1AQ crystal on 3780 kc. is heard during their Friday night meetings. An invitation is extended to all amateurs to visit the club shack on Kelly Ave., East Providence. The Rhode Island Radio Club is still under the leadership of W1BCR, whose station is also the control for the North American Radiophone League.

Traffic: W1MO 10, W1AAD 17, W1ASZ 14, W1AWE 18, W1BQD 22, W1QR 45, W1CPV 19.

CONNECTICUT — SCM, Fred A. Ells, Jr., W1CTI — WICJD reports his BPL total by radio. W1BEO also reports by radio. W1HD is working good DX on 3725 kc. W1AMQ has a job in Providence, R. I. W1MK reports the usual good total. W1CTI is active between 7 and 7:45 a.m. W1BDI heard several of the gang CTNITE but thinks morning would be the best time for our monthly QSO Party. Will you give it a try, gang? W1FL reports just in time to make this copy. W1ZY, Yale Radio Club, has a fine report for a starter. W1AVB sends in his first report. W1BBU QSO'ed W9DRQ with 6.5 watts input on 3665 kc. W1UE has been QRL other things besides radio. W1AFB is being heard in England on 3500 kc. W1BNB has trouble with skip effect. W1HQ has a 'phone schedule with W1BCR three times a week. W1BVW is way down in Georgia at the Army Signal school. His brother keeps W1BVW on the air. W1QV is starting a local traffic net for low power 'phones in New London. W1CDS, ex-W1AJS, wants schedules with Waterbury, Bristol, Bridgeport and Milford. W1TD says ND CTNITE. W1AWS says his receiver went on the bum. W1AMG says W1AGT has been elected Traffic Manager of the T.C.R.C. W1AVS claims DX is better than traffic. W1AQF has a new T.P.T.G. in push pull on 7 mc. W1NN, ex-W1VE, is back to shore again. W1ZL has been busy with 28 mc. The Conn. Brass Pounders Association is having weekly code and theory classes and working on the club station. W1ASF of E. Mass. wins the Handbook for high deliveries. Who gets it next?

Traffic: W1MK 427, W1CJD 305, W1BEO 139, W1HD 129, W1AMQ 93, W1CTI 82, W1BDI 76, W1FL 75, W1ZY 74, W1AVB 61, W1BBU 58, W1UE 55, W1AFB 52, W1BNB 43, W1HQ 21, W1BVW 19, W1QV 14, W1CDS 12, W1TD 9, W1AWS 8, W1AMG 6, W1AVS 6, W1AQF 3, W1NN 3.

NORTHWESTERN DIVISION

IDAHO — SCM, Oscar E. Johnson, W7AKZ — W7AAJ and W7IY are on 1750-kc. 'phone. W7ACD worked 9 states in one night on the same band. W7AT is going FB now. W7AVR is a new man at Post Falls. W7ATX has "broken the ice." The 3500-kc. 'phone band has W7CG,

W7AIS, W7ALW, W7ALC, W7GU, W7AUB, and W7AOO for supporters. W7AFT suffered slump in traffic because of lack of "juice." W7ALY and W7ATN have new receiver. W7AVY (ex7HE) is on in Caldwell. W7KG is putting new push-pull rig on the air in Boise. W7AIV and W7QD have been on the sick list. W7AJQ is busy with school. W7AVP and W7AXY are new men in Boise. W7ACP has given up 'phone in favor of traffic. W7AKZ has been working in Sweepstakes contest. W7ALH has rebuilt. Any hams interested in making schedules will do well to write W7ACP, the new RM.

Traffic: W7ACD 10, W7IY 37, W7AT 23, W7AFT 10, W7AOO 1, W7AKZ 40.

MONTANA — SCM, O. W. Viers, W7AAT — W7ASQ, W7ANT, W7AHF and W7CU are new ORS. W7AWM is a new station in Helena on 3500 kc. W7HP blew his new power transformer. W7ANT is on 3540 kc. with 'phone. W7CU and W7BW are looking for lots of traffic. W7AOH is getting east FB on his 50 watter. W7AYR has a type '10 with 600 volts pure DC. W7AFU has a type '10 TNT. W7EL is now BC operator at Missoula. W7DD is still operating BC station KGCX at Wolfe Point. W7AAT has gone back to his type '52 and '03A. W7FL says "the 'phones are getting thick in Montana."

Traffic: W7AAT 244, W7ASQ 97, W7CU 41, W7HP 17, W7ANT 8, W7FL 47.

WASHINGTON — SCM, Eugene A. Piety, W7ACS — W7OJ takes the traffic honors this month. W7AQB of Hoquiam reports three new hams there, W7AYY, W7AYZ, and W7AZA. W7ABN is back on with his new license. W7ADR is on 3.5 mc. with a 'phone set. W7AVM is a new ham in Aberdeen. W7TK seems to be the only one on in Everett. W7IQ is pushing a 250 watter with a crystal. W7MX is still working DX on his rig. W7KQ doesn't find much time to be on at present. The Aussies continue to give W7AAX good reports. W7MR bought a crystal and turned around and dropped it! The Tacoma Radio Club played host to the Seattle bunch and 56 men attended the meeting. W7ACS has completed his new 3.5 mc. crystal controlled 50 watt outfit. W7APF built a new receiver. W7KT sold his outfit to W7NA. W7AVN is a new ham in Tacoma. W7KZ and W7AIT keep things humming in Olympia. W7ATV paid the RI a visit and secured a new license. W7AJS is on during his noon hours. W7WY keeps Vancouver alive. W7DF is back on the air. The chicken business keeps W7IG off the air because of voltage drop due to too many incubators. Hi. W7AJU is a new ham there. W7AHO is going to Alaska for the summer. W7APR is the most active station in Spokane. W7QI received an honorable discharge from the ranks of the unemployed. W7KO continued to handle a few on 'phone. W7AG-W7SL handles all of his traffic on 3.5 mc. 'phone. W7BR threatens to go on 3.5 mc. 'phone. W7TX states that his Alaskan schedules are beginning to work again. W7RT is building the Seattle Radio Club's new transmitter to go on the air with the call W7IK. W7FJ is assembling his new 75 watt transmitter. The SCM took a trip east of the mountains and visited the Walla Walla and the Yakima radio clubs. At Walla Walla, W7AGP, the President, is giving code class to about 15 prospective amateurs. W7GW is on with 'phone. The radio club of Yakima which was reorganized February 8th is about the livest club in the state. They boast a membership of 62 active members. Art Clayton of KIT is the president. W7AQ, the club's station, is on most of the day and night handling traffic. W7ANF handled his messages by 'phone. W7ADS, the traffic manager of the club, has a good report. W7AEX helps out with a report. The Radio Club of Yakima are planning to send out a booklet to all the hams in the 7th district. Don't forget the 1931 convention at Tacoma!

Traffic: W7OJ 93, W7KZ 55, W7APR 53, W7RT 50, W7ABN 43, W7AG 42, W7TX 36, W7AFX 35, W7ADS 30, W7AHO 28, W7KO 27, W7AQ 25, W7AVM 23, W7TK 26, W7QI 22, W7AIT 22, W7ANF 9, W7AEX 8, W7WY 8, W7BR 8, W7AJS 6, W7KQ 6, W7IG 5, W7IQ 4, W7ACS 4, W7AGP 2, W7MX 2, W7FJ 1.

OREGON — SCM, W. S. Claypool, W7UN — W7ACH did great work with traffic this month. W7ZD still maintains a very high point in this section. W7TO surprises us with a report. Three daily traffic schedules help W7WR. W7ALM is rebuilding to MOPA. W7AMF and W7WL are doing the same. W7EO has four hams near him now. W7AHJ and W7AJX are going to organize a Hamfest during the Harbor Jubilee to be held next summer. W7AFL and W7APE joined the A.A.R.S. W7QY liked the YLs at the O.S.C. Exposition. W7AIG oiled up his transmitter and went DXing. W7PE reports. W7AHZ held a FB Hamfest with W7ACH, W7AWH, W7PI, W7AWL, W7AZK, W7AHX and W7PV among those present. W7AME keeps Ashland red hot with traffic. W7ED is now an ORS. W7IF, W7ALO and W7UN work ZL stations on 3500 kc.

Traffic: W7ACH 373, W7ZD 166,W7TO 137, W7WR 110, W7ALM 67, W7AMF 49, W7ED 100, W7APE 55, W7AME 51, W7IF 5, W7PE 19, W7QY 15, W7AIG 14, W7AHJ 3, W7AJX 3, W7EO 9, W7AHZ 2, W7AFL 13.

PACIFIC DIVISION

SAN DIEGO — SCM, H. A. Ambler, W6EOP — W6AXV makes the BPL. He reports the arrival of a new YL on Friday the 13th. W6ACJ was on for the last two RMNITES. W6CTP turned in a fine report. W6AEP now belongs to the Army Net. W6BAM says DX is good on 14 mc. W6AZV is on the air at Costa Mesa. W6EMA and W6EZP are recuperating from a Marathon QSO of 18 hours. W6ADC built a new portable and new receiver. W6EPZ expects to go to sea soon. W6EOS is now on with a type '01A. W6CTR had the honor of starting two of the transcontinental messages on 'phone. W6AYK was sick in bed and did not get to handle any traffic. W6BAS is busy grinding crystals. W6CNK has two new converts to amateur radio and says one will sign up for the Naval Reserves. W6EZP put up a new 52-foot mast. W6FP of Oceanside entertained the PAT club Monday Night, Feb. 16, and had as guests W6FJ and W6AVJ from Los Angeles and W6MK from Long Beach.

Traffic: W6AXV 234, W6ACJ 29, W6CTP 28, W6AEP 26, W6BAM 9, W6EMA 8, W6ADC 6, W6EOP 6, W6EOS 2, W6CTR 2.

SANTA CLARA VALLEY — SCM, F. J. Quement, W6NX — Congratulations, gang, on the remarkable traffic handling carried on during the month. With W6HM handling his usual 500 transpacific messages and with PI schedules being maintained by W6BAX and W6BYY, this section is taking a "lion's share" of the transpacific amateur communications. Amateur activity at Santa Cruz is well represented by the work of W6YG, W6DRU and W6DCP who contribute 600 messages. San Mateo-W6ALW and W6ASE are the Section's mainstays. The next Tri-sectional meeting will be held there as a complement to their interests in the affairs of this Section. W6AMM is back in the game. Now watch the section total climb. W6FEY is a newcomer from Carmel. W6FBU and W6FBW are handling their consistent traffic. W6EGV and W6ACV are active members of the SCCARA. W6BET broke into the traffic game with a bang this month. W6BHY has a new National Thrill Box receiver. If a 100% report is received next month, we will be over the 2000 mark. Let's do it, gang.

Traffic: W6HM 486, W6YG 306, W6DRU 245, W6ALW 236, W6AMM 88, W6EEY 33, W6BAX 64, W6BYY 90, W6DCP 30, W6FBU 13, W6FBW 7, W6EGV 14, W6ACV 8, W6BET 46, W6NX 4.

SAN FRANCISCO — SCM, C. F. Bane, W6WB — W6EKC tops the section, closely followed by W6ABB. W6ERK has just about become inactive, business (and other things) taking most of his available time. W6DZZ is maintaining his Philippine schedules. W6BNA is making good on his boast to handle all the traffic he can find. W6DFR dropped down slightly due probably to the increased QRM on 3500 kc. W6CIS reports working XAU1ZB. W6DXW informs us that he is going to cram for a commercial ticket shortly. W6CAL is sporting a brand new ORS certificate. W6AMZ contributes his usual total to the cause. W6DTZ expects to ship out *after* the International Tests. We suspect old W6BIP is again suffering from his old trouble; namely, YLs. W6ERS is beginning to hit his stride. W6PQ finds his time limited due to school. W6DOT was finally persuaded to report. W6WN, his neighbor, says lots of QRM due to W6WB's new type '52. Hi! W6DZQ is spending most of his time on 3500-kc. 'phone. W6ATI has launched off on a Super Het. W6PW says he will gladly give QRG to any one asking for same. W6WB will be glad to hear from any one desiring to make 28 mc. tests or schedules. Same holds good for W6FK on 56 mc.

Traffic: W6EKC 197, W6ABB 184, W6ERK 105, W6ERS 85, W6DZZ 86, W6BNA 83, W6DFR 73, W6CIS 32, W6DXW 22, W6CAL 24, W6AMZ 14, W6DTZ 15, W6BIP 55, W6PQ 14, W6DZQ 1, W6ATI 1, W6WB 5, W6PW 6, W6DOT 31.

SAN JOAQUIN VALLEY — SCM, E. J. Beall, W6BVY — The SCM, a Lieutenant in the U.S.N.R., put in fifteen days active duty at Navy Headquarters at San Francisco during Fleet concentration at Panama. W6AME has built

a new MOPA. W6BRV is handling plenty traffic. W6DCG was elected Pres. of the MARC. W6DCI has a 'phone and what a 'phone. W6FFU is busy with college. W6BJE is a new man. The Modesto Junior College is installing a pair of fifties in push-pull. W6KU is interested in the 1750-kc. band. W6CLP is handling plenty traffic. W6COJ is a new man in Hughson. W6CHC is with the Tel. Co. W6BQD moved to Fullerton. W6BRV has a schedule with W6DCI. W6BZZ sold his complete layout to W6BRW. W6QA grinds crystals for a pastime. W6CXT can be heard on the air most any night with his good 'phone and handles all messages with the layout. W6BYH wants to increase power. W6EXM is a new man in Escalon. W6BUZ is another man with a good 'phone who handles traffic with both C.W. and 'phone. W6AHO will take command of the Fresno Unit Naval Reserve. W6EKH got a good transformer from W6AME. W6BNH who took on a new bride (don't misunderstand, this is his first) some time ago will help out the traffic total next month. Nothing was heard from W6SF in Stockton or W6AV in Lodi this month.

Traffic: W6AHO 205, W6BUZ 27, W6BYH 8, W6QA 67, W6CLP 37, W6KU 20, W6CXT 112, W6BRV 238, W6AME 10, W6BVY 55.

EAST BAY — SCM, J. Walter Frates, W6CZR — Traffic totals soared due to a booth maintained by a group of Berkeley Boy Scouts at their Merit Badge Exposition in the Berkeley Armory. W6AMY, the National Guard station in the Armory, handled most of the traffic with the assistance of W6CYD, W6CIQ, W6EMF and W6BTW. The Scouts had a very instructive exhibit in the booth arranged through the RCA and W6ZM, the CRM. W6AZH made the BPL. W6ASH worked on the 14 mc., 7 mc., and 3500 kc.-bands. W6CIQ took a lot of the overflow from the Merit Badge Exposition. W6EDO is closing his station to resume training with the U.S.N.R. in San Francisco. W6ALX bat out more than 100 messages this month. W6ATJ, new ORS, is making an FB start in the traffic game. W6DQH has been forced to QRT until he gets his new licenses although he is still on the air from KRE. W6CIG has a peanut 'phone working on 3500 kc. W6BTZ has moved to his old QRA on Sixty-first Street. W6RJ has been visiting W7IF, W7WL, W7MY and W7AJX in Oregon this month, using his portable call W7RM. W6BI has been busy clicking in the Transcon. W6BZU reports things slow out at Concord. W6ZM has been busy with section affairs. W6CFD was one of the fellows QSO with VKs during the earthquake. W6FAJ reports school QRM keeping him busy. W6EJA says traveling on a tanker up and down the coast doesn't give him much time for ham radio. W6EDR after several months of silence finally had a message thrust upon him. W6BMS after two years on the 3500-kc. band, is going bac kto 7000 kc. W6BUX will be on 'phone on 14,000 kc. soon. W6AOH reports the organization of the Sonoma County Radio Club at a meeting on February 9 in W6ADM's old radio shack. Thirty-five members were present the first night, and 100 members are expected soon. W6BYS has an attack of a bad disease called YLitis. W6CZN says it is too cold in his shack to work traffic or DX. W6AUT has been off the air for over a month due to too much other business. A new club was organized in the section recently under the name of the Berkeley Radio Association through the efforts of W6BI and other Berkeley fellows. The club now has a membership of about thirty-five, and meets on the first and third Wednesday of each month. W6ZX has been elected President. Other officers are W6FCO Vice-President, W6ASH Secretary, W6BMS Treasurer, and W6CKC Chairman of the Board of Directors. The Oakland Radio Club, with W6CGM as President, has been making extensive plans for the coming year. W6BSB returned home from his Greenland expedition this month without his beard and in the best of health. At the section meeting last month the members of the section voted to present the Oakland Free Library with a year's subscription to *QST* and a copy of the latest edition of Handy's Handbook to be placed in the radio collection. W6AN is chairman of the committee appointed to investigate the matter of getting a portable transmitter for the section for use in case of emergencies. W6ZD, Director, spoke on the Japanese commercial QRM situation and reported other things of interest in the Division. The Oakland Chamber of Commerce held a Radio Day luncheon in the Athens Athletic Club recently as part of its series on important industries. The SCM was a member of the committee, and all phases of radio were represented, including broadcast stations, radio entertainers, hams, dealers, jobbers, distributors, etc. Mr. Don Gilman of NBC was the speaker, and Preston Allen of KLX, an old ham, chairman. The A.R.R.L. received good publicity from newspaper announcements, literature on the tables, and pads of message blanks for all those who attended to write a message. W6DWI, W6ATT, W6GQ, and W6CFD did FB work during the ZL earthquake and fire and deserve to be complimented. W6CYD handled a lot of the Merit Badge traffic from the Berkeley Armory. W6DWI scored a high total with traffic from the New Zealand earthquake and fire.

Traffic: W6AMY 500, W6AZH 418, W6ASH 286, W6CYD 293, W6CIQ 226, W6EDO 204, W6DWI 169, W6ALX 104, W6ATJ 62, W6DQH 29, W6CIG 21, W6BTZ 26, W6RJ 24, W6BI 24, W6BZU 16, W6ZM 10, W6CFD 8, W6FAJ 6, W6EJA 4, W6EDR 1.

NEVADA — SCM, Keston L. Ramsey, W6EAD — W9DIB in Davenport, Iowa wrote the SCM about a schedule with Nevada, that being his last state to QSO. The schedule was arranged with W6AJP and they hooked the first try. A message was sent from DIB's wife to her cousin in Reno, who happened to be W6AJP's mail man. W6UO took part in the Transcons. C. B. Alexander, Ex NN7C of the Marines is located at Hawthorne and will be on the air as soon as he gets his license. W6CDZ is QRL with school work. W6CRF is on 'phone with two crystals for rapid QSY. W6BYR, a new ham, is all set for some work on 'phone. W6BTJ is on the air again with a type '01. W6EAD has been QRL for a couple of months. There has been a Naval Reserve Unit established in Reno with 14 men passing the medical examination. Melville Ellison of the Department of Commerce Airways Station has been appointed as Ensign in charge of the group.

Traffic: W6AJP 73, W6UO 65, W6CDZ 45, W6CRF 26, W6EAD 4.

PHILIPPINES — Acting SCM, John R. Schultz, KA1JR — No report received as this issue goes to press. KA1HR reports direct to HQs that schedules are maintained with AC1LF, AC3MA, KA9PB, AC8ZW, W6QP, VK6MO, W6ALU, W6TM and W6AKW — a mighty imposing list.

Traffic: KA1HR 1432.

ARIZONA — SCM, Russ Shortman, W6BWS — As this issue goes to press your SCM is in Dallas, Texas on business. What information is available is being written up at HQs. W6ALU is keeping schedules with KA1HR, KA1CE, W3CXL and W5BBQ and ran up a very high total. W6BWS is studying aircraft transmitters and installations.

Traffic: W6ALU 767.

HAWAII — SCM, L. A. Walworth, K6CIB — Maui High School, K6CRW, at Hamakuapoko, Lahainaluna Tech. High School, K6YAJ, Lahaina, McKinley High School of Honolulu, K6YAL, and Kalaheo Radio Club have each secured permission to teach Amateur Radio Telegraphy in their respective schools as a one semester course carrying one half unit credit. The seventh edition Amateur Hand Book is being used as a text and the total enrollment in the four schools is seventy-nine. K6CCS has changed hands and is now the call of Hisashi Takase of 1111 Fort Street, Honolulu. Another new call is K6BAZ, Kenneth Lum King of 1317 South Beretania Street, Honolulu. K6AGL, Thomas Takesue of Kahului, Maui, T. H. is still another. K6EKX, Lt. Kruger of Schofield has sold his station and leaves Hawaii, Feb. 17. Director Babcock sent greetings to all K6 Hams through the SCM. K6ENE on Molokai is assisting the U.S. Army with airplane maneuvers. K6AJA made BPL. Messrs. Chilton and Pike of K6CDD just returned from two weeks' vacation at the Volcano and report a grand time.

Traffic: K6AJA 228, K6BOE 89, K6CMP 71, K6COG 61, K6DMM 33, K6DYC 15, K6ENE 9, K6ERH 6, K6CRU 2, K6BAZ 2, K6ERO 1.

LOS ANGELES — Acting SCM, Chas. A. Nichols, W6ASM — This is W6ASM pinch-hitting again for W6EQF. Your next report will be written by W6HT. The A.R.R.C. continues to hold meetings under the towers of KGFJ and have been having some interesting meetings. Meetings are held on the first and third Wednesdays of each month and the latch string is still out. The Associated Radio Amateurs of Long Beach continue to meet over the jail in the city hall and eat Hot Dogs on the pike after the meetings. The Highland Park gang is growing stronger each meeting and invites all hams to their meetings. The Pasadena Short Wave Club is still going strong and may put on the next banquet. Five stations made the BPL: W6QP, W6AKW, W6AOA, W6ETJ and W6WA. W6BGF rebuilt his power supply. W6DER reports that W4OO is in town. W6CXW is expecting to make a trip to Japan soon. W6DLI

reports the Army net going strong. W6AM is using a 612 foot doublet for both transmitting and receiving. W6AEO is now using MOPA. W6EAF is using crystal control on 3780 kc. W6DQV reports the call of the U.S.N.R. Radio Club of Bakersfield as being W6KE. W6AGR has been cleaning and resting up the last month. W6ESA is keeping in touch with KA1SL which is operated by his father and chum, W6EKE. W6DZF has new MOPA transmitter and AC receiver. W6ACL finally got his crystal outfit on the air. W6CUH had an hour and fifteen minutes QSO with UH7M for his fiftieth country. W6DZI has a better filter now. W6EZG has his new transmitter using on type '04A going strong. W6AWY is building a new shack on a hill. W6WA has been very busy with U.S.N.R. work. W6VH has been on 14,000 kc. W6DOZ is still QRL school. W6BVZ is working schedule with a fishing boat off the coast of Mexico. W6ZZA says that his portable works better than ever. W6MA is keeping daily schedules with W6ZZA while he is away. W6HT is working on a remote control system ten blocks away. W6AZL has MOPA bug and is building one using a fifty watter as the final amplifier. W6WO is getting crystal reports all the time now. W6ID has been QSO South America quite often on 14 mc. W6FJ is gathering parts for a type '52 crystal job. W6DAK has worked all districts. W6MK says it won't be long now — until his crystal transmitter will be on the air. W6AKC has been in the hospital recovering from RF burns received from his 50 watt job. W6BCX is bothered with YLs and golf QRM. W6YAU is going strong in the Army net. Mrs. W6AWY will be on with low power soon. W6FFF is on with low power. W6QP still leads the section in traffic. W6AKW continues to be right amongst the leaders. W6AOA sent his report via radio through W6BNY. IPH, operated by W6EQF, is down in the wilds of Mexico. W6ASM had a fire in his shack and was burned about the face but is recovering nicely.

Traffic: W6QP 639, W6AKW 456, W6AOA 291, W6ETJ 197, W6BGF 85, W6DER 83, W6CXW 75, W6DLI 57, W6AM 53, W6AEO 48, W6EAF 44, W6VH 43, W6DQV 40, W6AGR 25, W6ESA 19, W6WA 157, W6DZF 18, W6ACL 14, W6CUH 12, W6CZT 11, W6DZI 9, W6EZG 8, W6AWY 6, W6EZL 6, W6DOZ 5, W6BVZ 2, W6ZZA 2, W6DAK 18, W6WO 16, W6FJ 6, W6ID 5.

ROANOKE DIVISION

WEST VIRGINIA — SCM, D. B. Morris, W8JM — W8OK leads the gang this month. W8CAY is away on a cruise. W8CBY, W8VJ, W8SP and W4AHM were visitors of W8OK. W8BOK is using Xtal controlled 'phone on 3502 kc. and c.w. on 3581 kc. W8TI is knocking off the West Coast quite regularly. W8QR is still confined to bed with a broken leg received in a motorcycle accident. W8ANV makes his first report. W8BTV said the Ohio Valley Amateur Club extends a cordial invitation to all visiting amateurs. Drop around, gang, when you are in Wheeling. W8DRL fights it out for possession of the air especially when W8BOK is on. W8CBV reports some one around Wheeling using fake foreign calls. W8DPO reports that "DX" is beginning to come in again. W8ATE visited with the ATA in Pittsburgh. W8CDV is installing 866's to get that canary bird note.

Traffic: W8OK 241, W8BOK 45, W8JM 40, W8TI 34, W8QR 27, W8ANV 25, W8BTV 24, W8DRL 22, W8CBV 15, W8DPO 14, W8ATE 12, W8BIZ 10, W8CKE 6, W8BOW 4, W8COV 2, W8AAI 1.

VIRGINIA — SCM, J. F. Wohlford, W3CA — W3CXM keeps schedules with both Coasts. W3WO rebuilt the transmitter. W3FJ made 1600 points in Sweepstakes contest. W3AGH uses 250 volts on two type '45's. W3AAJ QSO'ed W1BDI on Route Manager's Night. W3AEW has been issued an ORS appointment. W3CFL has a crystal controlled outfit on 7190 kc. W3ZU is now ready to check frequencies. W3ALL is active now on 7000 kc. W3BCI says QRM from school keeps him off the air. W3BFS will be on in short order. W3AMB makes the BPL this time. W3AFT is on now working on 3883 kc. W3AWS is ready to go again after having been destroyed by fire some time ago. W3HY visited in Richmond. W3BZ continues to improve. W3SE-W3CKK is tinkering with 'phone. W3AGY is a new station. W3AAR has trouble raising the gang on the 7000-kc. band. W3BGS is backing up the Virginia net. W3KG is working on new receiver. W3AGT took his 'phone off the air on account of heavy QRM. W3BAD's 'phone gets out well. W3AVP is on c.w. daily on 3500 kc. W3BAH was off air for short while when someone carried off most of his outfit. The Danville Military Institute Radio Club dedicated their new radio room with a program lasting several hours. W3ZA was temporarily off the air awaiting renewal of the license. W3BDZ is working 'phone in the early morning hours. W3BDW will operate W3BDZ on c.w. W3ASI was a recent visitor at W3CA's. W3ZA was also over. W3BMN was likewise a visitor. The code class from WRVA will help out the newcomers and those who want to learn the code. See W3AAJ care that station for the schedule.

Traffic: W3CXM 444, W3AMB 237, W3WO 192, W3FJ 188, W3HY 95, W3AAJ 79, W3AGH 75, W3AEW 57, W3CFL 25, W3ZU 6, W3AFT 8, W3SE-W3CKK 13.

NORTH CAROLINA — SCM, H. L. Caveness, W4DW — W4ABV is doing good work in traffic handling. W4DQ has moved his transmitter to his place of business. W4BV recently called on the SCM. W4NO sends in his first report. W4ANX, W4ANA, and W4APP are new hams in Greensboro. W4AIS also reports for the first time. W4AAE worked an OA for his best DX. W4EG is another DX worker. W4TU says his DX has been short. W4AGO says W4AKC has YL fever. W4ZB reports hearing G5BY on 28 mc. on Feb. 15. W4AEL also sends in his best report in traffic handled. W4TR has been working VK's, ZL's, and ships. W4ANP at Duke University is now on the air. And here comes W4ABW with the best report he has ever sent in. W4AHS worked X14 and DAIV. W4JR was heard often and loud in the Transcons and the Sweepstakes. W4RX tells us that W4WY gets out well with his 'phone. W4GG has moved to 14 mc. W4OC has his 'phone about ready to test out. We are sorry that W4EC did not know our address so that his fine report for January did not reach us. W4UI has sold out completely. W4QS reports wonderful results with his new two tube A.C. receiver. W4TN has a portable outfit with him at school in Chapel Hill. We have not learned the call of Mr. Hoover's station in Asheville, but he is reported as being on the air and having a "swell note." W4MI is heard quite regularly on 7 mc. W4LY and W4EJ have worked hams in Europe, S. A., Australia, Azores, and Peru. W4LY worked three F's in an hour and a PY an hour later. He received a card from one of the F's and report cards from Germany and Hungary, all three of which were timed and dated less than ten minutes apart. We have a note from Winston Salem Radio Club giving us some information about the work of the club. The State College Radio Club now has a TNT transmitter ready to go on the air as soon as license can be secured.

Traffic: W4DW 158, W4ZB 144, W4TR 92, W4AEL 80, W4JR 63, W4ABV 40, W4AHS 32, W4RX 31, W4ABW 30, W4TU 30, W4AAE 9, W4EG 9, W4AIS 7, W4GG 4, W4NO 4, W4AGO 2, W4DQ 1.

ROCKY MOUNTAIN DIVISION

UTAH-WYOMING — SCM, C. R. Miller, W6DPJ — W7HX comes through with a fine total. W7ALI is in line for ORS. W6BTX is having a lot of fun in the UARC low-power contest. W7AAH still finds 3.5-mc. band best for traffic. W6DPJ has a daily schedule with KA1SL. W6DWH says not much doing. Some of the gang are shouting for bigger write-ups in *QST;* this is possibly only if more stations report.

Traffic: W7HX 179, W6DPJ 148, W7ALI 41, W6BTX 40, W7AAH 34.

COLORADO — SCM, E. C. Stockman, W9ESA — The section deeply regrets the passing of one of its most enthusiastic members, W9AOD, who died February 5th. W9APZ and W9EFP are operating 'phone. W9DNP is rebuilding. W9FRQ is building a crystal rig. W9CSR is trying to get the wrinkles out of his receiver. W9GBQ is back from California and full of pep. W9CDE enjoyed the Army-Amateur QSO Party. W9CBU is a newcomer at Westminster. W9BNK just finished an MOPA. W9AQN is on the air again. W9CND reports good DX.

Traffic: W9ESA 191, W9DNP 126, W9EAM 90, W9AUJ 72, W9CND 48, W9AAB 20, W9FRQ 17, W9BNK 13, W9CDE 3.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Robert E. Troy, Jr., W4AHP — W4KP and W4EF are going on 'phone. W4AHP is putting in crystal control. W4IA was reported in New Zealand on 3500-kc. 'phone. W4LM is working hard for the illusive wampum. W4VC is on once in a while. W4PAI has installed 866's. W4VV is back on the air. W4LM worked IPH. The SCM and W4AJR enjoyed a visit in Selma. W4RS is a real station. W4DS has a nice outfit. W4AP has a receiver and transmitter that works like a charm. W4AAQ

got his commercial ticket recently. W4AP, W4IA and W4EF were among those to work AB6 on his test flight to Montgomery. A new ham is coming on the air at Kellyton.

Traffic: W4PAI 50, W4KP 16, W4LM 7, W4DS 10, W4IA 2, W4AJR 1.

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES-PORTO RICO-VIRGIN ISLANDS — SCM, J. C. Hagler, Jr., W4SS — I wish to thank the gang for the wonderful support that they have given me in this, my first month as SCM. We need applicants for OO, OBS, and ORS. We should also have some RMs. W4AU, W4AJH, W4ACH, W4BO, W4PJ, W4OT, W4AOR, and CM8YB applied for ORS. W4AOR uses 300 volts on a type '45. The Palmetto Amateur Radio Club meets every other Friday at the club room at the U. of S. C. in Columbia. W4CE is rebuilding his 'phone set. W4BO is working FB DX. W4ABP is staying with W4ACH for two months. W4ACH is interested in 1750-kc. work. W4APX is a new ham in Monroe, Ga. W4AJ and W4AOX are new men in Adel, Ga. W4OQ and W4GT went to Church convention in Chattanooga, Tenn. W4JD is very active. W4PM is very busy with the A-A Net. W4HN's OW is interested in 3500-kc. 'phone. W4ANK is a new ham in Columbia, S. C. W4AJH and W4AAY send in nice traffic totals. CM8YB is active again. W4VH is on the air at Pottstown, Penn. His call is W3BIY. W4CL is doing BC work in Toccoa, Ga. W4CO comes on with a new 'phone set in Columbia, S. C. W4IR is M. F. Jones, Editor of the A-A Bulletin of the Fourth Corps Area. W4AY is off the air every other month due to school QRM. W4AMA is an addition to the bunch in Atlanta. W4ZA is rebuilding. W4KX is working 3500-kc. 'phone. W4AAZ and W4ADD are stepping out. W4GB is getting out FB with his new 'phone outfit. W4JL has business QRM. W4CF is seldom on the air due to too much work. W4AAS reports a Ham Club in Macon. W4QZ wants a 'phone net in this Section. W4LL has a new mast. W4ZW is working 'phone on 3500 kc. W4UC is getting R9 reports from S. A. W4AMG, a new man in Augusta, is holding schedules with his brother, W9AMV. W4AQB and W4AQN are also new members of the Augusta gang. W4IS is moving his shack. W4AU has a new MOPA. The BC station in Savannah is keeping W4WZ busy. W4JJ just got married. W4OT is in Fla. for a while due to sickness. W4DN worked 3 ZLs in two nights. W4AHT is doing most of the key-work for the Tifton, Ga. gang. W4AEV, the editorial man of the Macon Ham Club, is on 'phone and c.w. W4WN is president of the Macon Club. A fine report was received from CM2JM. W4RN is off the air until summer, due to QRM at Ga. Tech. W4AOR is on 7 mc. with 300 volts on a type '45. W4KI is rebuilding for 7 mc. CM2FN reported traffic. We certainly want to see the bunch in Cuba, Virgin Islands, and Porto Rico working with us. Please write me, and give some dope and suggestions as we need that part of our section badly.

Traffic: W4SS 88, W4PM 44, W4JD 35, W4PJ 34, W4DV 21, W4AAY 20, W4BO 18, W4AJ 16, W4WQ 14, W4CE 11, W4AJH 10, W4AOR 8, W4GT 8, W4GB 6, W4HN 6, W4DN 5, W4ACH 3, CM2FN 100, CM2JM 11.

WESTERN FLORIDA — Report sent in S. M. Douglas W4ACB — On February 22nd the hams of West Florida met at Tallahassee in the biggest hamfest ever held in this section. The boys commenced arriving Saturday afternoon, and by midnight nineteen were present. They held forth at the shack of W4QR. During the evening somebody worked F8PZ and that broke up the party for the night. Early Sunday morning everybody was up and going again. After breakfast the local stations were inspected. Much comment was made on the orderly arrangement of W4AAX's 'phone set. A big laugh was had when W4MS' YF called W4AA at Union Springs, and he came back with "Sa, OM, who is at the mike?" The business meeting was held at the Studios of Newell N. Davis, and several items of general interest were discussed. Nominations for SCM were held, with Eddie Collins, W4MS, being the only one nominated. The most important part of the session was at two o'clock, when a dinner was enjoyed by all present. Nearly everybody left Sunday afternoon after expressing their thanks to the local hams for a good time. Tentative plans were made to hold the next meeting of the club at either Panama City or Valparaiso, Fla. on Memorial Day next. The following were present at Tallahassee: Orin Welch; H. Wimpy; R. M. Bennett, W4HC; M. Cawthorn, W4AQY; N. B. Davis, W4QR-W4AQG; J. W. Poole, W4ADS; H. Langley, W4APD; Hugh Mays, W4SC; S. M. Douglas, W4ACB; J. J. Wiggins, W4SC; Tom Butt, W4ABF; W. Dodd, W4DC; Jack Whitton, W4AOO; H. L. Gatewood; Waldo Lynch, W4ABJ; R. M. Purdy, W4VR; Eddie Collins, W4MS; Carroll Adams, W4AAB; Forest Ogilvie, W4HF; Herman Burman, W4AEM; Frank Speight and L. Marsh, W4AOC; Julius Poston, W4DP; Gilbert Nedley, W4ALH; E. K. McBride, W4KX; E. L. Udell, W4AAX; L. M. Rundlett, W1ART — Chief Operator, S. S. *Oceanographer;* Gordon Russell and Otis Fereman, W4AFT.

WEST GULF DIVISION

NEW MEXICO — SCM, Leavenworth Wheeler, Jr., W5AHI — W5TV had just made a fine start when the railroad laid him off. His ORS and OBS are cancelled at his request. Sorry to lose you, OM. W5AUW is running several schedules. W5AJR has gone in for low power 'phone on 3.5 mc. W5AOE has a new MOPA 'phone. W5ND has a new chemical rectifier. W5ZM returns to the fold with a report of good progress at the meetings of the N.M.M.I. Radio Club. W5AIE has a new MOPA. W5AHI remains in the BPL.

Traffic: W5AHI 574, W5TV 124, W5AUW 73, W5AJR 52, W5ND 26, W5ZM 15, W5JZ 8.

OKLAHOMA — SCM, Wm. J. Gentry, W5GF — Hats off to our star station, W5VQ. W5AMC made the BPL. W5PL is sure pounding out the traffic. W5BOE at Tulsa is the most active station there. W5ALF is going to help the beginners with code practise. W5OJ reports that Frederick has 9 amateurs now. W5AHV is building a push-pull transmitter. W5FJF and W5G had a nice time at the Mardi Gras. If you want information on U.S.N.R. write Mr. L. M. Edwards, MRK. M. Ehret, Oklahoma City, or myself. We need a Naval Reserve unit in Oklahoma City.

Traffic: W5VQ 702, W5AMC 226, W5PL 114, W5OJ 70, W5BOE 43, W5ALF 14, W5AHV 12, W5GF 12.

SOUTHERN TEXAS — SCM, H. C. Sherrod, W5ZG — Houston: W5EI is on again after moving. W5BHO is discontinuing all code broadcasts on March fifteenth. W5BTD is on and is surely welcome. W5BML is on occasionally as is W5BOC. W5YG where the genial Jimmie Watters holds forth has a beautiful new crystal controlled rig going on 7 mc. W5ASM is doing some good traffic work. W5CA is doing some excellent work also. W5TD is the new Vice-President of the Houston Amateur Radio Club. W5BKW is on 3500 kc. with 'phone. Galveston: W5AUX is on and working consistently. W5AVC is still using the hundred watter. W5BQJ is on intermittently. W5BTK is also working regularly now that a license has been acquired. Lt. Gibbons, of the third attack group will be on the air as soon as a license arrives. He is Ex-7EE. Flatonia: W5AJD has managed to return to the game in spite of heavy pressure from his business. San Antonio: W5UX is still working on the crystal rig. Corpus Christi: It is with regret that we record the removal of Mr. G. W. Holland, W5ATY, to the Northern Texas Section. Good luck, W5ATY, OM. Rosenberg: W5PU is on both 7 and 14 mc. El Campo: W5ACT, a new Official Relay Station, sends in a nice report. W5ACK is on often. W5SY is on with a T.P.T.G. rig. Baytown: Bohannon is on regularly with the 250 watt MOPA. According to Bohannon, Groves, Ex-W5NW and now PK 5NW sustained a minor injury to his brass pounding arm due to a fifteen foot fall. Too bad, OM.

Traffic: W5TD 14, W5ACT 22, W5AJD 44, W5PU 2, W5UX 2, W5BHO 21, W5BKW 23, W5EI 10, W5DS 14.

NORTHERN TEXAS — SCM, Roy Lee Taylor, W5RJ — W5WW has seven schedules. W5HY remarks "YLs and school." W5CF has five FB schedules. W5AUL has been appointed local net control for A.A.R.S. W5QU reports for the first time. W5BII reports too much QRM. W5RJ is working nearly everything that can be heard. W5ARK is tearing up the air again. W5BAM has moved to 3.5 mc. W5ARV has just rebuilt again. W5BAD is bound for Dallas to go to SMU. W5GZ is working plenty of DX. W5BQT hooked New Jersey and Calif. for his DX. W5AZP is having BCL trouble. W5BND is on 'phone. W5ALA is rebuilding. W5KL has two crystals and can QSY in one minute flat. W5BNO has just finished his crystal job. W5AGQ has a new SG receiver. W5BNN has his remote control going OK now. W1FX, now W5TH, has moved to Ft. Worth. W5BG says that DX has not been so good on 'phone lately. W5ACL works DX without trying. W5AQ, formerly of Dallas, has been transferred to Burbank, California. W5BTB sent his report via W5BGW.

Traffic: W5WW 276, W5HY 120, W5CF 101, W5AUL 79, W5QU 42, W5BII 40, W5RJ 38, W5ARK 34, W5BAM 26, W5ARV 14, W5BAD 11, W5GZ 3, W5BQT 5, W5BTB 8.

CANADA

The Board of Directors of the A.R.R.L. meets at Hartford on May 1st, and every member is hereby invited to forward to me at once any criticism, comment, or question which he would like to have placed before the Board. In particular, the 3500-kc. 'phone question will receive a great deal of attention at the coming meeting, and it is my desire to be fully informed on this matter. Is the 50 kc. now allotted to 'phones sufficient, or should there be an increase granted? If so, how many more kc.

The decision is in your hands; the majority will be my choice, so write me stating your views before May 1st.

CANADIAN GENERAL MANAGER
ALEX REID, VE2BE

MARITIME DIVISION

NOVA SCOTIA — SCM, A. M. Crowell, VE1DQ — VE1AK paid a flying visit to Halifax recently and Mrs. 1AK used the transmitter to advantage during his absence to QSO the gang and find out when the OM was coming home. VE1AS has been hopping from 14 mc. c.w. to 3.5-mc. 'phone. VE1AX has added another modulator tube and reports much better kick on his 'phone. VE1AZ recently visited VE1BV at Stewiacke. VE1AZ is still shoving out a nice 'phone signal. VE1BL says local QRM from his MG is going to end with the sale of the generator. VE1BN is keeping schedules with VE1AZ and VE1AX. VE1BV is a new ham at Stewiacke. VE1CC is working at his 14 mc.-'phone. VE1DR reports conditions on 14-mc. c.w. as being all haywire. VE1DQ is also giving the 14-mc. 'phone a swat with crystal control. Write in your ideas on the coming Convention in Halifax.

NEWFOUNDLAND — Acting SCM, E. V. Jerrett, VO5Z — VO5MC is our pioneer station on 28 mc. VO5AW has also started work on a 28-mc. transmitter. VO5AE keeps an early morning schedule at W1KH. VO5C and VO5J are back again after a long silence. WO5Z has put in emergency low power rig with B Batts. VO5WG is still silent.

ONTARIO DIVISION

ONTARIO — SCM, C. D. Lloyd, VE3CB — VE3GT once more heads the list and makes BPL. VE9AL reports the usual activity. VE3AD has schedules with VE3DW, VE3DA and VE3ZZ. VE3BC is on the air over week-ends. VE3ET is on the air with a type '10. He reports the call VE3HY assigned to G. H. Ireland, Englehart, Ont. VE3DM has been on the sick list. VE3ZZ was busy piling up points in Sweepstakes. VE3AQ is attending University in Toronto. VE3BO is somewhere in the north country. VE3BT is working all comers on 14 and 3.5-mc. 'phone. VE3DC is having great success with a 3.5-mc. crystal set. VE3PG has a new 3500-kc. Zepp. VE3CT clicked with a Cuban. VE3XK is on the air with 3500-kc. 'phone. VE3HT is installing a new type '03A. VE3DW has moved traffic. VE3XC and VE3EC report usual activity. VE3HD reports QSO with England, British West Indies, Peru, Newfoundland, Yukon and Czechoslovakia. VE3GK is getting out good on 3550 kc. VE3CE is QRL with studies. VE3HB has rebuilt his station. VE3DA reports conditions fair. VE3XJ is back with us again after two years off the air. VE3FD is doing good work with a low power push-pull outfit. VE3HA hands in a good total. VE3CB is not on much due to local QRM, but VE3DD reports a new transmitter and Zepp antenna.

Traffic: VE3GT 491, VE3HD 113, VE3ZZ 87, VE3AD 74, VE3HA 41, VE3DM 36, VE3GK 32, VE9AL 29, VE3DA 28, VE3XC 24, VE3DW 20, VE3HB 8, VE3BC 11, VE3EC 5.

QUEBEC DIVISION

QUEBEC — SCM, Alphy L. Blais, VE2AC — This is a record month in the history of our Section and promises to be the beginning of a very active and prosperous year. My job has been made easy thanks to the hard work of SCM assistant VE2AP who collected most of the reports. High honors are due VE2AP, VE2BB and VE2CP for the fine traffic work. Very important work has been done by our CGM, VE2BE, which cannot be recorded here but which you will hear about from us soon. VE2BG gets his ORS ticket. VE2BB makes the BPL. VE2CP is showing the true ham spirit. VE2BV is on 'phone. VE2AX has gone to Bermuda. VE2BY is using push-pull. VE2CU closes to pick up with college work. VE2BN wants 'phone men to handle traffic. VE2AI is doing much DX lately working VK, ZL, F, G. VE2AQ is working at club station VE2CP. VE2BO wants to prepare his exams now. VE2CA is rebuilding. VE2CR is a RCA photophone engineer. VE2CL is interested in traffic. VE2AP is preparing for B.E.R.U. week. VE2AC was heard on 28 mc. in Australia.

Traffic: VE2AC 278, VE2AP 229, VE2BB 202, VE2CP 125, VE2BE 29, VE2BZ 24, VE2BO 24, VE2CA 20, VE2CU 13, VE2AQ 12, VE2BG 11, VE2CK 11, VE2CO 11, VE2CR 9, VE2CJ 2, VE2CL 4.

VANALTA DIVISION

ALBERTA — SCM, G. F. Barron, VE4EC — VE4EI reports via telegram. VE4CY reports traffic and 'phone activity. VE4EA QSO'd a K7 this month. At the last meeting of the Canadian Amateur Wireless Association, held in Edmonton on February 7th, a very interesting lecture on the universal language "Esperanto" was given by Mr. W. Ruthien, resulting in the forming of a group known as the "Edmonton Esperanto Club." VE4EC is paging KA1HR for a QSL confirming QSO of January 8th, 1931. VE4HM reports a QSO with the Police Boat at Coronation Gulf in the Arctic. VE4FR was QSO a station in Czechoslovakia.

Traffic: VE4EI 38, VE4CY 9, VE4HM 7, VE4EC 3, VE4EA 1.

BRITISH COLUMBIA — SCM, J. K. Cavalsky, VE5AL — VE5GT is about to bud out with a 'phone. VE5DX works VE5EM at Coronation Gulf. VE5CM is rebuilding. VE5BR is on top of the traffic. VE5BL is on four bands. VE5AW has had a 1½ hour QSO with Australia on 3500 kc. VE5EF has worked as far as the east coast. VE5HG and VE5DS get south easily. VE5BC is still strutting his stuff on AC receivers. VE5FI has moved to his new location. VE5CF is now operating on two bands. VE5AC is looking for a new location. VE5AL holds down his schedules. VE5CW is experimenting with screen grid tubes in his transmitter. VE9AJ is putting out code practise. VE5CR is using a quarter Kilo. VE5CO handled an earthquake message to New Zealand. Married life seems too much for VE5DU. VE5EC lost his schedules. VE5CB is getting out fine. VE5AD is heard once in awhile. VE5AE is going to open up at Pachena.

Traffic: VE5AC 10, VE5AL 71, VE5BR 143, VE5BL 83, VE5AW 12, VE5CB 6, VE5CO 1, VE5EC 2.

PRAIRIE DIVISION

MANITOBA — SCM, A. V. Chase, VE4HR — VE4BD is experimenting with an A.C. screen grid R.F. and detector single control receiver. VE4IC is now using a type '52 in his transmitter. A very successful hamfest was held at VE4DK, and was well attended by the gang. VE4JB is busy at school. VE4AG, Secretary of the Telegraphers Radio Club, Winnipeg, reports that three more members will make their appearance on the air shortly. VE4AG contemplates building a push-pull TPTG using type '10's. VE4KA, Dauphin, has received his official call, VE4HT.

Traffic: VE4DJ 12, VE4HR 12, VE4BQ 5, VE4FP 1.

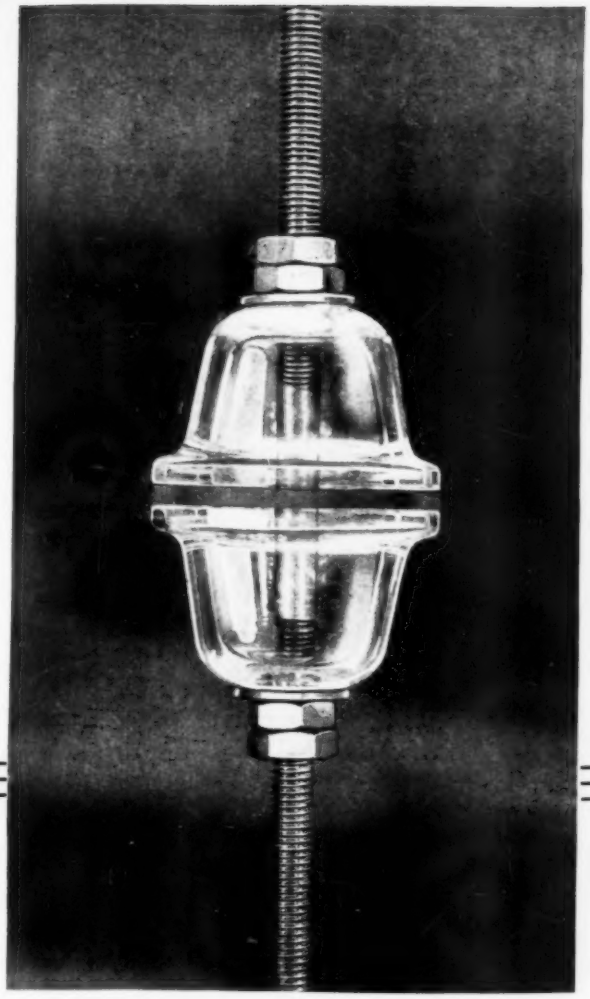
SASKATCHEWAN — SCM, W. J. Pickering, VE4FC — VE4IH has the 'phone bug since he heard VE4EI's voice on 3.5 mcs. VE4BB is working on 3500 kc. VE4GR seems to have quieted the BCLs or his key-clicks. VE4CV has been trying for DX on 14 mcs. VE4AT, VE4BE and VE4CV are new ORS. VE4BB has resigned as RM. VE4HU has a four tube crystal controlled outfit for 'phone and c.w.

Traffic: VE4IH 36, VE4BB 26, VE4GR 21, VE4CV 10, 4VEBE 8, VE4AT 3, VE4FC 1.

Traffic Briefs

CM2FN is the station operated by W2AMT and W2AKC while they are in Cuba for the winter season. They are using 75 watts and may be found on 7008 kc. Any traffic for Cuba will be gladly handled. CM2FN's QRA is Care Commercial Cable Co., Habana, Cuba.

W6AMW has been transferred from the Marine Barracks at Hampton Roads, Virginia, to Haiti, where he will soon go on the air with a fifty watter. He sends his 73 to the gang and hopes to make many contacts with the states, especially with "sixes."



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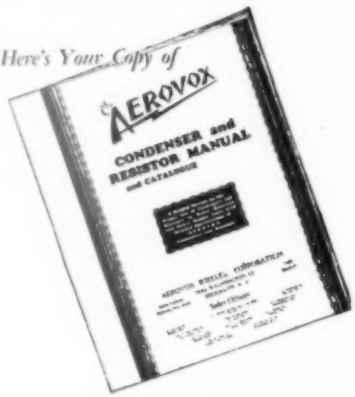

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PRODUCTS THAT ENDURE

ference whatsoever from the transmitter when working break-in. It was found desirable to connect a small condenser in series, as shown in Fig. 3.

The above scheme has now been in use for some time and has been found to give very satisfactory results. No reduction of feeder current is noticeable, and when using this scheme it is impossible to detect any difference in the note of the emitted wave when checked on a monitor.

As the electrical center to which the receiver is connected is at a point of zero voltage, this explains why no interference is noticeable when working break-in. There is actually less trans-

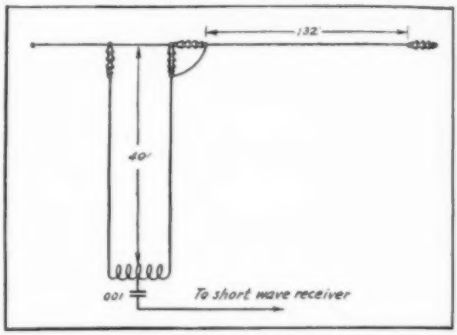

FIG. 3

mitter interference when using this scheme than when a short 20-foot wire at right angles to the transmitting antenna is used.

The best method to find the electrical center is to run a wire from the receiver with a clip attached and approximately 2000 ohms in series. Then with the transmitter key depressed touch the clip to different parts of the coupling coil until the point is found where the least interference is noticed on the receiver. It will be found that if this wire is touched even a few inches away from the exact electrical center that considerable interference is present. When the right point has been found the resistor can be eliminated and the condenser connected in its place.

The writer will be very much interested to find out what success others may have with this scheme, for it is a very simple way of working break-in without use of any relays and without the use of an additional receiving antenna.

Active Stations in the Transcon Relay

(*Continued from page 47*)

a brute-force filter with 30 henrys and 4 mikes.

VE3GT's receiver is a Grebe CR-18, with some changes made to help out on band-spreading. A home-made monitor is also in use.

The main antenna is a 3500-kc. voltage-fed Hertz. A separate 14-mc. indoor antenna was strung up indoors as an experiment and works so well that it has been regularly used on that band ever since. In the eight months that the station has been on the air stations all over the

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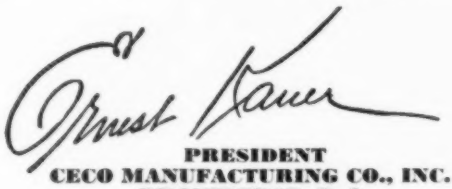

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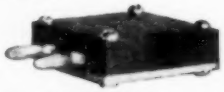

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U. S. and Canada have been worked, and Australia has been contacted on 7 mc.

W6KU

This station, one of the c.w. group, is owned by Robert Huff, Empire, Calif. The main transmitter is a breadboard Hi-C Hartley, employing a Type '52 oscillator, which can be used on either 3.5, 7, or 14 mc. An auxiliary transmitter using a Type '10 tube in the Hartley circuit works on the 1.75-mc. band, in addition to the other three bands.

The same plate and filament [illegible] is used for both transmitters.

W6KU

transformer is a 1-KW affair, giving 550, 1100, and 2200 volts on each side of the center tap. Two R3 Rectobulbs are used in the rectifier, and the filter consists of 4 μfd. and a 30-henry choke.

The receiver is the usual regenerative detector with two audio stages. A new a.c. receiver and a dynatron frequency meter are now under construction.

The main antenna is a 7-mc. Zepp, and there is also a 132-foot antenna and counterpoise for the 1.75-mc. band. A separate 30-foot antenna is used for receiving.

Calls Heard

(*Continued from page 55*)

Off New Zealand Coast

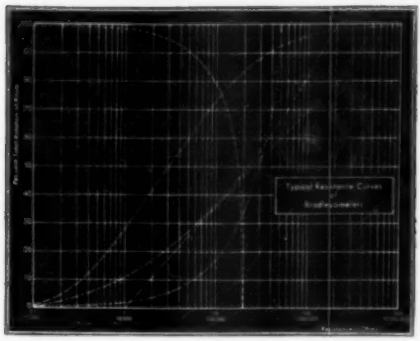
ac2eb ac2hm ac8ad au1kok au1kov ct1aa d4lgh ear53 eu2km f8hpd f8jd f8joz f8wok j1dv ka1cm ka1el ka1hu ka1za ka7lg k6ewz om1tb on4wa sp1yl ve4md vp1ws vk2av vk2br vk2eh vk2dy vk2gq vk2hc vk2hf vk2hm vk2jo vk2kj vk2ks vk2lr vk2ly vk2oc vk2rc vk2sa vk2vz vk2zz vk3ab kv3bw vk3cp vk3gj vk3ka vk3or vk3pl vk3rg vk3rz vk4ah vk4ju vk4xk vk5hg vk5it vk5wr vk5xk vk6ef vk6my vk6wi vs2af vs6ag vs6ah w2vy w4ln w5axx w5jc w6aiw w6am w6awa w6bax w6bht w6cel w6cfa w6csj w6cvf w6dcy w6der w6dgu w6dip w6dsz w6dui w6esq w6ebo w6egm w6uc w7qf w8alo w8arb w9ajo w9amd w9feu w9lf w9rp zl1ac zl1ba zl1ce zl1cc zl1fb zl2ab zl2aj zl2bv zl2eo zl2dj zl2dn zl2ge zl2gk zl2gm zl2gn zl2gq zl2gw zl3ae zl3as zl3aw zl3bh zl3cm zl4ap zl4bl zl4bo zl4xc

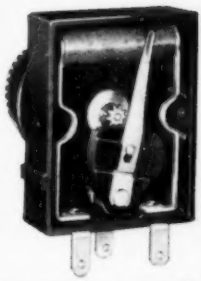
14,000-kc. band — Off New Zealand Coast

ct1aa g5by k2hb oa4z pk3bq pk4aj st2d vk2jz vk2lr vk2wu vk2xa vk3hk vk3oc vk3xi vk4lj vk4ju vk5am vk3bm vk5lz vk5rk vk5dq vk6kz vk6sa w8aup w8cra x4m zl4aq zl4bt

VE4AI, H. B. Broten, Box 86, Meacham, Sask., Canada

ce1ah ce2ab ce3agu ce3bf ce3dg ce5aa cm2jt cm2xx ct1bz ct2ac f8ex f8fr f8hr f8pz g5bj g5by g5ml g5yg g6rg g6vp g6wt g6wy h61fg h61lc hc2jm k6bhl k6bxw k6cec k6ef k6ewb la1w lu1ba lu2aa lu2ay lu2ba lu2ca lu2fi lu2rk lu3ar lu4da lu4fa lu8dy lu8en nn1nnc oa4j oa4o oa4z oa5j on4fd on4fp py1ah py1ak py1aw py1ca py1cm py2ab py2aq





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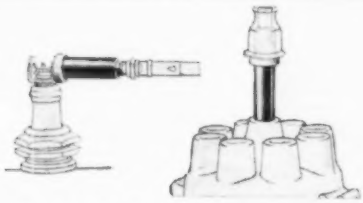

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py2bf py2bg py2bs py2ik py2qb vk2ac vk2ek vk2fp vk2he vk2oj vk2pp vk3bw vk3da vk3dr vk3es vk3jk vk3rg vk4wk x1aa x3a x9a xcdq ys1ap zl1an zl1fr zl2ac zl3bb wfa wfat

VE3GT, S. B. Trainer, Jr., 4 Shorncliffe Ave., Toronto 5, Canada

ce1ah cm2jm cm2wa cm2wd cm5by cm5cx cm8uf cn2 ct1aa ct2ac d4sux f3mta f8ex f8pz g2ay g2by g2vq g5by g5ml g6dh g6rb g6rg g6rh g6vp g6wt g6xq he2jc hc2jm hh7e ka1hr k4aan k4rj k4ug k6evl k6evx nj2pa nn7xj oa4z py1ah py2bf tg2clo ti3xa v1ja vn2bg vo8an vo8aw vo8z vk3hk vk3rg vk3wl x1aa x1g x1gx x6j x9a x9c xd4bef zl1ar zl2ac zl2aj zl2gk zl3aj zs1p zt1t

W1BUX, Doug Borden, 77 Tenth St., Providence, R. I.

14,000-kc. band

cm1by cm2jm cm2sh cm2wd cm2xd cm5cx cp1pw ct1aa ct1ae ct2ac d4daf d4wao ear96 ear98 ear128 ear136 ei8c f2iz f3mta f3smi f8btr f8cla f8cs f8ej f8eo f8eq f8ew f8ex f8fo f8fr f8gq f8kwt f8kz f8ol f8pat f8pz f8rio f8rj f8ru f8swa f8tex f8tv f8whg f8zst fm8cr fm8lc g2ao g2ay g2by g2cj g2dh g2dz g2kf g2ma g2pa g2sw g2vq g2zp g2ru g2kl g5bj g5by g5ml g5oc g5vm g5yk g6cl g6dh g6fa g6gs g6hp g6li g6ll g6nf g6ps g6qb g6rb g6rg g6vp g6wt g6wy g6xb g6xq he1fg he2jc he2jm k4alk k4kd k4rj la1g nl8mre oa4j oa4y oa4z oh1nf oh2nm oh3na oh5ng oh7nb oh7nc oh7nd oh7nf on4au on4be on4fe on4fp on4fq on4jb on4jj oz7t oz7y pa0dw pa0qf pa0wr pc3 py1aw ti3xa vk2jz vk3uk vk3xi vk4ab vk4gk vk4rj vk5hg vo8ae vo8aw vo8me vo8z vu2bg vu2pn v1yb x1aa x1n x9a zl4bt zs1p zs4m zs6y zt1t zt2c cn2 k5xo xf8map x4m vn2bg

7000-kc. band

cm2jm cm8lc cnz4 f8btr ti3xa vk2ns yn2bg wsq

W8JB, Edmund J. Papierski, 77 E. Doughty St., Dunkirk, N. Y.

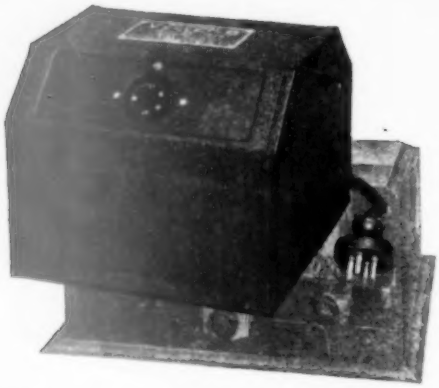
3500-kc. 'phone band

w1aar w1aug w1auy w1avk w1bcr w1bw w1cz w1gw w1io w1lc w1su w2ahg w2aoe w2asq w2az w2bn w2ede w2ekw w2eoj w2gj w2jj w2qm w2tp w3aex w3ati w3bfz w3chi w3oo w3ss w4bs w4rx w4tm w4wm w5kx w5pp w8aat w8adf w8agu w8ahf w8ajh w8amd w8apv w8arm 28arw w8awa w8ayy w8bae w8bbq w8bcg w8bcv w8bej w8bnk w8bok w8bpw w8bup w8bvh w8bxb w8bxt w8bxy w8byc w8byr w8ccw w8cez w8chc w8chp w8cin w8ckg w8cmk w8cnk w8epf w8cqc w8cvz w8cwa w8cxo w8cyc w8cza w8dbq w8dia w8dmi w8dsw w8ewt w8ih w8iy w8jh w8nx w8rl w8rw w8uz w8wf w9aai w9aib w9avg w9bde w9bjl w9bmx w9bpq w9byd w9cfh w9cju w9clz w9cmz w9csp w9daq w9dbo w9dgb w9een w9esl w9etd w9ewc w9fei w9fke w9flt w9fqu w9gku w9suj ve3bm

W5BAD-W5AJS, George A. Krutilek, 1011 So. Paris St., Ennis, Texas

7000-kc. band

w1bes w1axv w1mk w1aps w2afj w2vy w2pd w2alu w2fm w2edk w2ev w2lp w2zc w2dyx w2bda w2ccj w2atz w3nr w3adl w3qu w3bhm w3aer w3ajh w3ask w3ax w4hu w4qe w4lt w4alg w4fv w4vk w4pf w4lj w4gj w4ql w4acj w4aea w4rx w4akp w4aef w4oi w4ca w4adt w4is w4jh w4lm w4gw w4aks w4kk w4ao w4nl w4qv w4jl w4tj w4fv w4jq w4akg w4ew w4ct w4mm w4hc w4akm w4ly w4ci w5mz w5bnk w5ds w5blj w5afs w5tg w5mi w5abi w5aap w5pg w5yw w5aob w5mm w5aal w5bke w5nd w5bnn w5bny w5ajd w5bld w5si w5qj w5tm w5lp w5zg w5ga w5bnd w5aap w5bnx w5fe w5bg w5bam w5acy w5aqy w5aeh w5aja w5uf w5no w5bek w5ef w5hy w5jc w5bbv w5lq w5ayl w5eb w5age w5bjs w5bjg w5fs w5de w5afx w5afi w5wf w5bja w5mh w5bfx w5bhv w5bev w5aem w5ww w5gg w5aia w5aew w5apg w5bkk w5bln w5bol w5jk w5ajl w5ahi w5zk w5pu w5bor w5qx w5bkl w5aug w5vd w5anq w5bby w5beb w5afn w6edp w6qp w6bar w6ekr w6hm w6jn w6oj w6aga w6bqk w6dyn w6eje w6bgc w6een w6akw w6ebz w6akf w6cii w6bck w6ept w6aot w6clx w6aop w6dnf w6cxw w6cbp w6re w6sf w6yx w6dpj w6de w6eri w6dui w6bzy w6axe w6aom w6bi w6ake w6lp w6cnx w7je w7qf w7aob w7vk w7vc w7alw w7hcy w7hot w7ra w7afl w7al w7aag w7wv w7ba w8bps w8cln w8agj w8csh w8ov w8ant w8dcg w8adu w8drf w8cga w8dbv w8bck w8btk w8lt w8jd w8ddo w8en



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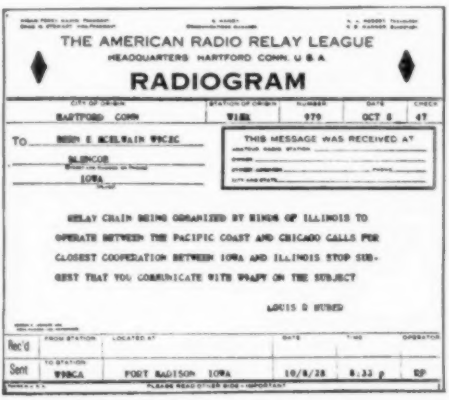

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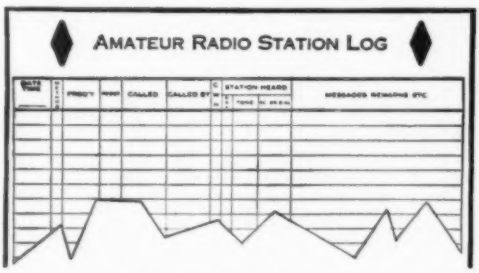

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w8eym w8np w8ecs w8aj w8epq w9yl w9esk w9eeo w9eou w9hw w9bez w9gdm w9dzw w9ddq w9ddo w9fdj w9feq w9lf w9emj w9ehd w9dol w9gv w9epi w9mi w9ggb w9io w9gex w9gar w9anv w9etc w9azy w9gkn w9ews w9efa w9cfn w9dwa w9ell w9aah w9fta w9tm w9dga w9ajg w9crm w9aag w9asv w9bcs w9bwj w9dad w9bvr w9dgt w9lq vk1he vk3dx vk5hg vk3jl vk3rg vk2qt vk1ac vk3jk vk2hk k6avl k6evw k6dv k6dud k6ekx k6bt k6dqf k7aoa zl4am zl3as wfat kalpa kalbe kaldj kalce kalcm kalhr kfr6 kdv5 kfr5 k4kd cm8yb cm2jm ve3be ve4ik ve5hy ve4cv nn7nic nncab nn1nic y4is

VK3UK, Vaughan E. Marshall, 5 Fordholm Rd., Hawthorne E 2, Victoria, Australia

au1ck ac1bd ac1bx ac1ts ac2ff ac3ma ac5go ac8ag ac8cd ac8ea ac8em ac9gh ce1ah ce1ak ce1er ce3ab ct1aa ct1ar ctbbx ev5or cx2bt d4by d4yt ear6 ear36 ear39 ear96 f8aly f8aj f8axq f8ep f8ej f8eo f8fo f8fr f8ix f8lr f8pz f8wb fm8asm fx7ef g2vq g5by g5bz g5ms g5qv g5yk g6rb g6wy g5aq helfg ha1bk it6het j1da j1do j1dq j1dr j2eb j2wv j3er ka1ab ka1af ka1ce ka1em ka1ex ka1cy ka1dj ka1dk ka1el ka1fc ka1he ka1hr ka1if ka1ip ka1jr ka1me ka1pw ka1re ka1rw ka1ze ka1zr ka4hw k6aew k6a1m k6avl k6bjj k6boe k6bra k6bvk k6cjh k6ekx k6ene k6ewb k6tk lu1ca lu1dy lu3de oa4j oa4l oa4m oa4q oa4t oa4v oa4z oh2pp om1tb on4he on4ja os7y pk1ex pk1jr pk3bm pk3bq pk4az ry2b ti2hv un8ww vp1az vs2xf vs6ab vs6ae vs6af vs6ag vs7al vs7ap vu2gb vu4se

A Harmonic Monitor

(*Continued from page 12*)

tor is not obligatory, however; lower frequencies may be used until satisfactory signal strength is obtained. A monitor of this type may be constructed from an old broadcast tuner if desired, but its use as a frequency meter is somewhat restricted.

CALIBRATION

Once the proper band-spread has been obtained, it is time to think about calibration. First pick out some reliable commercial or government station — or group of them — to be used as checks. The list on page 26 of January *QST* will be helpful. Of course it will be advantageous to select stations near the band on which most of the transmitting is done; for instance, the 3500-kc. man will find NAA on 4015 kc. an excellent check. There are innumerable stations on both sides of the 7000- and 14,000-kc. bands which will serve very well as markers.

The stations in question should be tuned in on the receiver and the correct monitor harmonic tuned to zero beat with the signal. After a series of such points is obtained the readings for each station should be jotted down and the list kept in some convenient place where it will not be lost. Thereafter, the list is used as a guide whenever the monitor is to be used for frequency measurement. If at some later time the settings have been found to be shifted slightly from the original readings, set the dial at the correct point and adjust the trimmer condenser until the marker is again brought to zero beat.

The checking stations should be picked out and logged before the main calibration, which should be taken from Standard Frequency Transmissions or other sources of accurate calibration signals, is made. Thereafter any compensating adjustments which are made with the trimmer condenser to bring the marker stations back to their proper places on the dial will also restore the original calibration. The latter should be checked occasionally, however, to make sure

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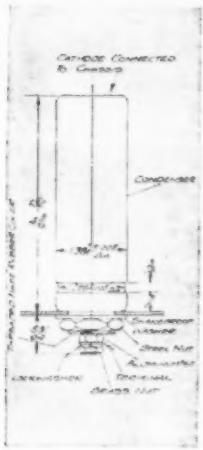
Can—dull nickel finish

Small space—high capacity

High voltage—self-healing



RADIO engineers of 1931 receiving sets will receive with unqualified approval this announcement of a Sprague Electrolytic Condenser that helps materially in their problems to make the new radio receivers as simple as possible, more efficient than ever before—and at the same time conserve time, space and expense.

Only an organization like SPRAGUE, with superb modern manufacturing facilities, highly developed research laboratories, an engineering department devoted to the problems of the set manufacturer, and a highly trained personnel could produce the tremendous improvement represented by this new SPRAGUE INVERTED ELECTROYLTIC CONDENSER in tremendous quantities with unqualified UNIFORMITY.

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Trouble Shooter's Manual

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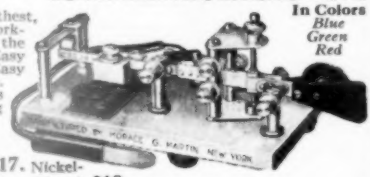

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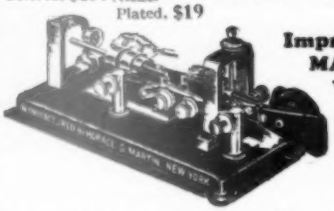

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that nothing has gone wrong, although any unusual discrepancies will be immediately noticeable because all the marker stations will not be found in their proper places.

If the monitor is to be used for frequency measuring a dial with readable scale divisions and a decent indicator must be used, otherwise a lot of the possible accuracy in measurement is thrown away. This subject was covered in some detail in the October 1930 issue of *QST*, and need not be repeated here. A good dial is an excellent investment, however.

Harmonics, once looked upon as necessary nuisances — some harmonic *radiations* still are — are an important part of present day amateur radio. We work our antennas on harmonics; we amplify harmonics to make our crystal-controlled transmitters work on high frequencies; we find them invaluable in frequency measurement; in fact, nowadays we couldn't very well get along without them. The harmonic monitor is just another application.

I.A.R.U. News

(*Continued from page 54*)

messages were relayed from America to relatives believed to be in danger, and inquiries made as to the welfare of others. In one notable instance a Berkeley amateur succeeded in settling definitely the fears of San Francisco shipping interests and relatives of the safety of a San Francisco cargo vessel with its California crew, believed to be in the harbor of Napier when the earthquake struck.

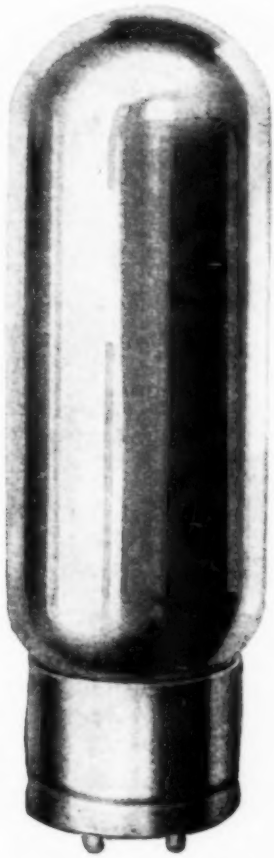
But above all this, the American amateurs provided phlegmatic broadcast listeners, in the habit of being thrilled by the reception of a "Mammy song" from a nearby state, with an idea of the range of amateur communication, how consistent it could be when the occasion arose, what really good operators the hams are even under adverse conditions, what untiring workers they are, and how many exist in their midst. It was a definite, convincing, and working demonstration of utility and capability that had a definite public good-will value far superior to reams of newspaper publicity or official commendation. In the particular area around San Francisco Bay, it resulted in awakening the interest of the newspapers in these generally silent "attic adventurers" and in earning their respect and admiration.

— - - - —

The active work internally of New Zealand amateurs of all districts and the stricken area, aided in rushing forward the rescue work and securing medical and surgical aid for the injured and dying. New Zealand amateurs in and near the scene of the quake found their equipment largely destroyed by the tremors, and electricity cut off. By gathering all available batteries, enough transmitters were put on the air to establish outside communication, and due to their efforts airplanes were dispatched to the region

RCA RADIOTRON

UV-211



Firm net price

$30.00

An excellent general purpose transmitting tube

THE well deserved popularity of the type UV-211 Radiotron among the Amateur Fraternity is due to its variety of applications.

This versatile tube can be used as a modulator, oscillator, audio frequency and radio frequency power amplifier.

When used as an oscillator or class "C" amplifier at recommended frequencies, type UV-211 will deliver an output of over 75 watts.

Nominal Rating

Filament voltage	10 volts
Filament current	3.25 amperes

As AF Amplifier Class "A"

Plate voltage	1000 volts
Bias	−55 volts
Plate current	72 milliamperes
Output (5% second harmonic)	10 watts

Oscillator or Class "C" Amplifier

Plate voltage	1000 volts
Grid Bias	−200 volts
Plate current	175 milliamperes
Plate Dissipation max.	100 watts
Power output	75 watts

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A Radio Corporation of America Subsidiary

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loaded with serums and medical supplies for use in the relief work.

— - - - —

Once more we send out a combined SOS and QRR and Mayday call for pictures to illustrate these pages. Remember, this is not the technical section nor a department devoted to station descriptions. Of course, we all like to look at pictures of the other fellow's station, particularly if it is located in some remote corner of the earth, but we want to get a view of the whole station in the picture, and we wouldn't mind seeing the

CM8UF, Earle D. Byer, U. S. Naval Station, Guantanamo Bay, Cuba, is well known in international work, as well as in A.R.R.L. Com. Dept. Tests. The receiver is all "dolled"-up — what an inspiration to good work!

operator in it, either. Those pictures of societies and clubs and other groups are particularly interesting.

There are certain technical rules and requirements which must be applied to any photographs to be used in *QST* — in this department as well as any other. They are clearly outlined on page 36 of the October 1930 issue of *QST*. Many really interesting photographs are received from amateurs in various countries which are totally unsuited for reproduction because of their small size, lack of detail, or dull finish. We'd be glad to use them, but . . .

— - - - —

We'd like also to receive more of those short, meaty items of news which some of you send in quite regularly. In the United States amateurs have acquired a quite consistent (and admirable) habit of jotting down briefly all their more noteworthy activities and sending them in to *QST* for use as Strays and Traffic Briefs. Can't you fellows in the Antipodes, on the Continent, over in Africa, down in South America, out there in Asia, do the same thing for use in this international department of the magazine?

Of course, there are the national reports, and very worthwhile they are. But we can use individual, more personalized items and bits of news, to good effect, too. Let's have those pictures and more of those friendly letters, then.

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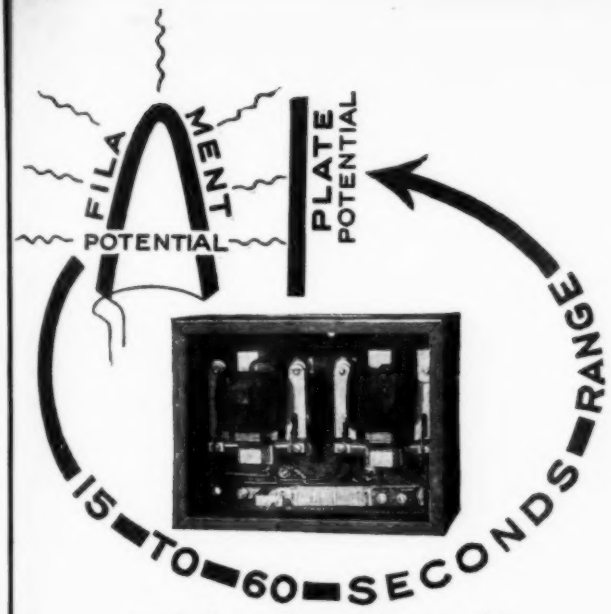
Good news! The ban on transmitting in Cuba



Send for information on this and other Ward Leonard relays.

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Time Delay RELAY

SET the time delay . . . for example . . . at 30 seconds

CLOSE the circuit . . . starting the cycle of operations

OPEN the circuit . . . before the 30 seconds has elapsed . . . stopping the cycle of operations

RESTART . . . and the original setting of 30 seconds has not been shortened

WARD LEONARD ELECTRIC CO., MOUNT VERNON NEW YORK

ALUMINUM BOX SHIELDS

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ANY SIZE TO ORDER

Coil Shields, Coil Hole Covers, Shielded Wire. National Equitune 500 mmf. Cond. Reg. Price $5. Special $1.50. 1000 Cycle Buzzer.....50c

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SMALL—UNBREAKABLE—POSITIVE
A SWITCH THAT IS OPERATED BY A BEAM OF LIGHT.
SUITABLE FOR COUNTING, SORTING, TRAFFIC CONTROL, ALARMS & ETC.
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Guaranteed — Mounted — Complete

1 KVA 3 phase 1500–2000 v. each side.....$40.00
700 watt 1000—1500 each side.....14.50
250 watt 500—750—1000 each side unmounted $10.00; mounted $11.50
Auto-Transformers, Chokes, Polyphase and 25-cycle Transformers. Add $2.00 for fil. winding

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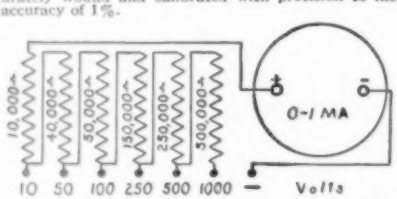
accurately wound and calibrated with precision to insure an accuracy of 1%.



This sketch shows the proper resistors to be used with the new Weston 0-1 A.C. Rectifier Type Milliammeter for a range of 10 to 1000 volts A.C. Higher ranges are possible.

Write for Bulletin 100-C showing our original Voltmeter Multiplier Chart and other instrument diagrams

Super AKRA-OHM — **Shallcross Mfg. Company** — Accurate NON-INDUCTIVE WIRE WOUND RESISTORS

ELECTRICAL SPECIALTIES
700 PARKER AVENUE
Collingdale, Pa.

has been lifted, writes Silvio Hernandez, CM2SH, and amateurs can once more transmit freely there. This also means that cards can now be sent to Cuban stations direct, and the "Under Cover" caption published in February *QST* is superfluous. Cards for unknown stations can be sent via A.R.R.L., or to CM2SH at: H. nr. 184, Entre 21 y, 23 Vedado, Havana, Cuba.

Australian Report

By W. G. Sones, Fed. Pub. Officer W.I.A.

The following message was received through W8BAZ, J. L. Kelley, 318 W. Newell St., Syracuse, N. Y.

HR MSG FM MELBOURNE AUSTRALIA VK3ML NR 2 8 FEB TO ARRL HARTFORD CONN

THIS MESSAGE IS BEING FORWARDED THROUGH THE FEDERAL TRAFFIC MANAGER FOR THE W I A WHO HAS BEEN FORTUNATE IN ARRANGING CONTACT WITH W8BAZ AND CONVEYS THE GREETINGS OF THE FEDERAL EXECUTIVE OF THE W I A TO ALL U S A EXPERIMENTERS STOP IT IS HOPED TO BE ABLE TO FORWARD I A R U REPORTS THROUGH THIS CHANNEL IN FUTURE STOP THE ORGANIZATION OF A FEDERAL TRAFFIC CHANNEL FOR VK IS A RECENT ACTIVITY AND HAS BEEN ORGANIZED BY VK3ML THE FEDERAL TRAFFIC MANAGER WITH REGULAR SCHEDULES TO ALL VK STATIONS GREAT BRITAIN AND U S A STOP THE NUMBER OF LOCAL MESSAGES HANDLED FOR MONTH OF JANUARY IS AN EXAMPLE OF THE SUCCESS OF THE SCHEME AND MESSAGES INTENDED FOR THE VK SECTION MAY NOW BE ROUTED VIA THIS CHANNEL STOP TOTALS FOLLOW:

	OUTWARD	INWARD	RELAYED	TOTAL
VK3ML	65	95	9	169
VK4JI	28	25	0	53
VK2HU and 2RC	33	36	37	106
VK5IT	31	33	28	92
VK6WL	18	22	0	40
VK7CH	12	12	0	24

(SIG) SONES FEDERAL PUBLICITY OFFICER W I A

British Notes

By J. Clarricoats, Hon. Sec'y R.S.G.B.

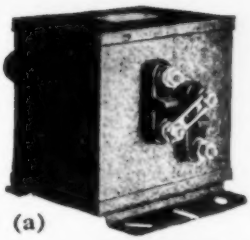
The 28-mc. tests which were held during January proved very disappointing indeed. The full results will be available in our next notes, but it is regretted that no new ground has been broken. We wish to thank all amateurs who have assisted in these tests, and particularly would we express our appreciation to the editors of the numerous foreign and colonial amateur magazines who gave us publicity.

The 1.7-mc. tests are to be carried out during March, and we trust more success will have been obtained on this band.

During the period April 11th to 18th, a large number of British stations will partake in a special series of one-watt tests. We ask that all European and North American amateurs will assist us in this effort to prove the usefulness of low power. Transmissions will take place on all amateur bands for which the stations are licensed.

The President of the R.S.G.B., Mr. H. Bevan Swift, delivered an address entitled "The Progress of Amateur Radio," on January 30th. A large and distinguished company were present

Our new Circuit Diagram on this equipment will enable you to obtain results not obtainable before. It is free. No obligation. *Send for it today.*



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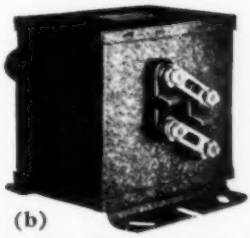

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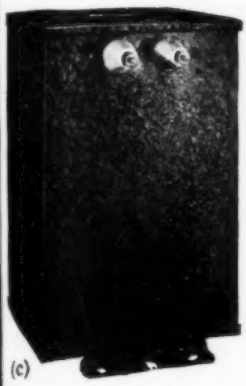

(c)

Above, Thordarson's Filament Supply Transformers — (a) Primary Coils connected in series for use on 220 volt 60 cycles (b) Primary Coils connected in parallel for use on 110 volt 60 cycle current. At left, Thordarson's Filter Reactor.

New Transmitting Power Supply Equipment

New capacities . . . New construction . . . New ratings . . . New prices. This equipment is all mounted in completely enclosed cases and sealed with a moisture proof compound. The cases are finished with a high grade crystal baked lacquer. This construction renders our equipment impervious to all atmospheric conditions. Salt sea and humid atmospheres have no effect on its operation.

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40-75 meters	$17.50
75-100 meters	12.50
100-200 meters	9.00
200-600 meters	15.00
1 in. Tested blanks, 200-400, 400-600 meters	3.50
Dustproof Bakelite mounts	3.00

(A Calibration furnished with each crystal)
Sections of any practicable dimensions made to order
(Charges for grinding to exact frequencies given on request)

J. T. Rooney, B. Sc., 4 Calumet Bldg., Buffalo, New York
"A pioneer crystal grinder"

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3 — NEW Amplifiers

Using the famous Loftin-White Direct-Coupled Circuit, perfected by Electrad. 245, 250 and 250 push-pull output, covering all modern requirements.

Send 10c to Dept. Q-4 for new Catalog, all products.

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ELECTRAD INC.

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Attenuator network, T system, 60 db in 3 db steps, 500 ohm line, units **$27.50. FILAMENT TRANSFORMERS** — 5000 volt ins. 100 watt **$5.50**, 150 watt, **$6.50**, 250 watt, **$8.00**, 500 watt, **$13.00**, 750 watt, **$18.00**, 1000 watt, **$26.00. PLATE TRANSFORMERS** — 1500 each side 300 MA, **$19.50**. 1500–1000 each side 200 MA, **$15.00**, 1000–750–500 each side, 160 MA, **$10.50**. 1 KVA, **$26.75**, 1½ KVA, **$34.50**, 2 KVA, **$42.00**, 2½ KVA, **$54.00**, 3 KVA, **$69.00. CHOKES** — (See our March ad.) Special transformers chokes and resistors. Five-day delivery. Stock articles ONE day shipments.

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WRITE FOR LITERATURE

CHARLES J. BODNAR
641 BARRINGTON STREET
HALIFAX, N. S., CANADA

and much interest was shown in the old types of apparatus which were exhibited.

The opening of the 3.5-mc. band has resulted in increased activity, and much interesting work is being carried on between British and American amateurs. Occasionally contacts with North America have been made with inputs below 50 watts.

Conditions on 7 and 14 mc. were slightly below normal for the time of year.

German Notes

By Dr. Curt Lamm, Foreign Sec'y D.A.S.D.

General receiving conditions were exceedingly bad on nearly all bands during the period covered by the present report, and it is remarkable to notice how much worse DX conditions have as a general rule become in comparison with the same periods in 1926–27 (and '28 — *C.B.D.*), when on 7 mc. at 2100 G.C.T. the Yanks were simply pouring in on any ordinary receivers, and their 60-cycle notes interfered badly with local stations many a time. There really seems to be some sort of a "short circuit" in the ether nowadays. What do the other Sections on this side think, as well as those across the "pond"?

In daylight, European stations are being heard on 7 mc., but hardly any DX comes through, and one is mighty lucky to catch an Aussie or a Zedder on this band. After sunset the nearer Europeans fade out completely, but Spanish, Portuguese, Azores, and other stations come in quite well. Again, no DX.

On 14 mc. some long distance stations come in quite well, but only a few D's have succeeded in establishing contact with the U. S. A. while quite a few QSO's have been carried on recently with our Antipodes.

On 28 mc. we were not at all successful, and so far not even British stations were audible at the time of the R.S.G.B. 28-mc. tests. This evidently shows that the band at present is not at all reliable.

On 3.5 mc. we have a greatly increased activity to report, this band being used to a considerable extent for European night traffic, but a QSO between D4UAN of Nuernberg and the U. S. must be mentioned.

Our Sixth Annual Convention will be held at Hamburg on May 24th and 25th (Whitsuntide). The details of the event will be dealt with in the next issue of *QST*. Meanwhile, we cordially invite all amateurs abroad to join us at this occasion. The D.A.S.D. will be only too pleased to forward all further information to anyone requesting it. The address is: Blumenthalstrasse 19, Berlin W. 57, Germany.

Norwegian Notes

By G. H. Petersen, Pres. N.R.R.L.

From our Government we received a fine Christmas present when the 3.5-mc. band was given over to the unrestricted use of amateurs just before Christmas, reserving only a margin of safety on each side. Activity is very great on this band, and the N.R.R.L. plans a new series

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of tests with message handling in the near future, to establish inland communication lines.

Interest in short-waves is immense in Norway, the N.R.R.L. membership increasing steadily, and many new transmitters being put on the air. Conditions are fine, special mention being made of the ease with which W's are contacted in the 14-mc. band.

A message containing a part of the above report was also given by LA1G, Leif Salicath, Vice-President N.R.R.L., to W8CRA, Frank Lucas, Canonsburg, Pa., in FB manner through considerable QRM.

New Zealand Report

By D. Wilkinson, Vice-Pres. N.Z.A.R.T.

The Annual Convention of the N. Z. A. R. T. was held in Wellington during the period between Christmas and the New Year, and again proved an outstanding success, amateurs from most districts in New Zealand being present. As a result of the annual election of officers, Mr. H. V. P. Brown, ZL3CG, of Christchurch, becomes President of the Association for 1931. Heartiest congratulations, OM.

The DX season is again in full swing, but unlike last year, has so far proved very patchy. Up to the present the 7000-kc. band has proved superior to 14 mc. for European contact in the early evenings and mornings, both in signal strength and reliability, but at times the 14-mc. band has been very good in the late evening corresponding with mid-day conditions in Europe. During this session some very good contacts have been made and regular schedules kept with Europe. Comparatively few W stations are heard on this band this season, although the South Americans are very QSA. On the whole the 14-mc. band has proved not nearly as reliable so far this season as in past years, and for that reason very little has been tried up to the present on 28 mc.

The W stations on 3.5 mc. both on 'phone and c.w. continue to come through very well here between 0600 and 0900 G.C.T.; some have the strength of 7-mc. sigs. We hope to arrange a test on this band with the U.S.A. in the near future. (OK, OM. GA. — *C. B. D.*) This band is very popular in New Zealand for experimental 'phone work.

Our congratulations go to ZL1AK, who it is learned was the only amateur station to both hear and answer the SOS distress signals of the S.S. *Hedwig*, wrecked on the Chinese coast last month. This ship sent her distress calls on 40 meters.

All ZL stations are now anxiously awaiting the B.E.R.U. tests to be held during the last week in February. Conditions are usually then at their best here in N. Z. and some wonderful performances are expected. No doubt the 14-mc. band will be *the* band for these tests.

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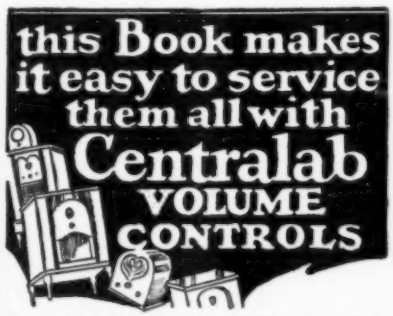

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— *Harold Schneider*

'Phone-Vs.-C. W. Transcon Relay Results

(*Continued from page 24*)

anxious to help out. This resulted in the generation of several alternate routes. We will explain these routes as best we can with the data at hand.

No. 88PSHF18: Upon receipt of this message W9GFL relayed to W8BTK and to W9ART. W8BTK sent it along, but W9ART'S disposition of it is unknown.

No. 81GJYW11: W9COS had a streak of bad luck upon receiving the reply to this one. He contacted W8CNM and sent the transcon, only to have OM Skip get busy and blot out the contact before a successful QSP could be made. Some time later he relayed to W9EYH as is shown in the table.

No. 36KNCA93: This was intercepted by W1SZ while W3ATJ was sending it to W3UX. SZ did not relay. At W9ANR QSP was attempted to W9FIK, but no OK was received.

No. 86LODB16 starting at W4PM reached W3BFK somehow and was relayed to W8DLG, who sent it along to W9ANR. W9DZK also received the message (possibly from W9ANR). W7ACH received it from W9DCD, Clinton, Mo., but did not send reply due to bad QRM.

No. 63FIXV93: W8KD received this one from W4JR and relayed to W8DSP. W8DSP sent to W8CPE, who transmitted to both W8BZB and W1SZ. From W8BZB it went W8CNM-W9CVQ-?. W1SZ sent the message QST, as well as to W8HF. No further reports were received explaining the routes from W8HF and W9CVQ.

No. 00HKZX30: W2BGO intercepted this while W2COS was sending it to W8BAS. W2BGO's route shown in the table was the most successful. W8BAS sent the message to W7ACQ, but was unable to get a QSL. He also sent it on to W9EYH, who did not relay as he discovered that it had already reached W9COS at Rochester, Minn., via the main route.

No. 76ZCRP17 took two distinctly different routes across the continent. One of these routes, shown in the table, was started in daylight (7:57 a.m.). The other started at 5:47 p.m. and traveled W6AM-W9EXP-W9APY-W3BQV-W1AWQ. W1AWQ is believed to have held it due to the late hour received.

On the second Sunday, January 18th, six of the c.w. messages took side-routes. One of them, that started by W1CDX, did some pretty strenuous jumping around. Let us examine them all.

No. 27LODB40: W4JR started this to W8CEO as well as to W6AKW. W8CEO relayed on to W9ACL, who held the message knowing that W4JR had already received a reply from W6AKW. W6BAO at Salt Lake City, Utah, also picked this one up from some station and shot it out to W6AM. W6AM gave W6BAO a reply. No word was received from W6BAO.

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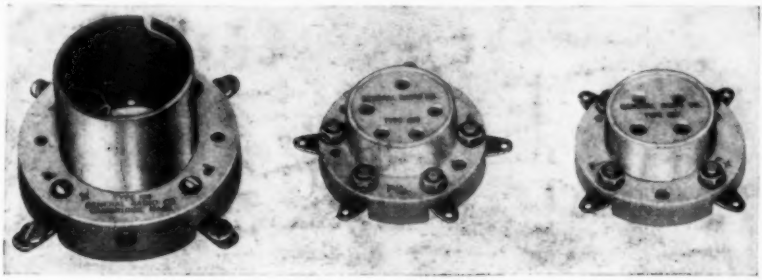

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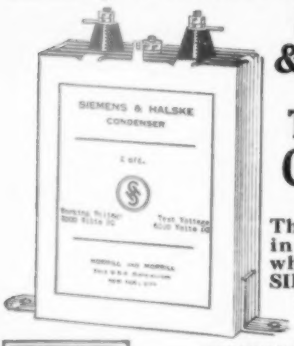

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1500	4000	1	6 –1¾–2¼
		2	4¾–2 –6
		4	4¾–4 –6
2000	6000	1	4¾–1 –6
		2	4¾–2 –6
		4	4¾–4 –6
3000	10000	1	4¾–4 –6
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No. 37GJYW50: This is the real Chinese puzzle! The best route is shown with all the other main routes in the table. In addition to that the following took place: Just as a special test W1CDX started a "reply to the reply to his message." This message was addressed to W7ALM (the station originating the reply to CDX's message) and traveled W1CDX-W1BDI-W8CJS-W8BAT-W1SZ-W7AAT-W7ALM, arriving at W7ALM at 7:55 p.m. P.S.T. In other words, W1CDX got his message across the continent, received a reply from W7ALM, and got an answer to that reply back to W7ALM, all before the closing time! VE3GT, one of the stations on the main route, started another to W8CEO-W9COS-W7AAT-W6BBO-W7AAT. W8BHK received the message from an unknown source and was the first point on the following route—W8BHK-W8BZB-W8ID-W8AKV-W9EPO-W9EYH-W9BNT-W7AAT-W6KU-W7AAT. In the case of both of these routes W7AAT held the message as the closing time overtook it at his station. It will be noticed that the transcon reached the coast on both routes and replies were started back. W8VCJ also got hold of it somewhere and sent it to VE3GT, from where it went to W8CNM-W9BBU-W9EJQ-W9BOQ, where it died. W8TZ also "horned in" on it and passed it to VE3GT. VE3GT figured he had forwarded it enough already so he held it this time.

No. 23UXMK36 made a complete circuit as shown in the table summary. Also, W6RJ got hold of W4JR's reply and gave it to W6UO, who passed it to W7ALO in Salem, Oregon. Whether W7ALO got it back into Washington is not known.

No. 22FIXV35: Nothing extraordinary happened to this one. W9BNT attempted to QSP to W6GF but, due to fading signals, had to cancel and relay to W7AAT a few minutes later.

No. 38XAPN51 arrived at W1MK right on the dot, 11:30 p.m. E.S.T., the closing time of the relay. However, as it was only 10:30 at W9BCA a reply was started and traveled W1MK-W9BCA-W7AAT-W6BBO, where it died. Of course this late route does not count in the relay.

No. 93ORGE06: W3AAJ addressed his transcon to W7ZD, Portland, Oregon, instead of to "Any West Coast Amateur." The result was that it got to W7ZD — but not all the way on 3.5 mc. It reached W7ALM okay on 3.5 mc. Wishing to complete the route and knowing that W7ZD was operating on 7 mc. W7ALM shifted to that band. He raised W7ED and gave him the message. W7ED then worked W7LK in Portland. W7LK called W7ZD on the telephone and told him that W7ED had a message for him. W7ZD immediately came on the air and took the message from W7ED. While not strictly in accordance with the rules of the transcons, the message traveled all the way by radio and exemplifies the fine amateur spirit of coöperation. Credit is given for this message only covering the time it was handled on 3.5 mc. The 7-mc. work is not considered in grading the message.

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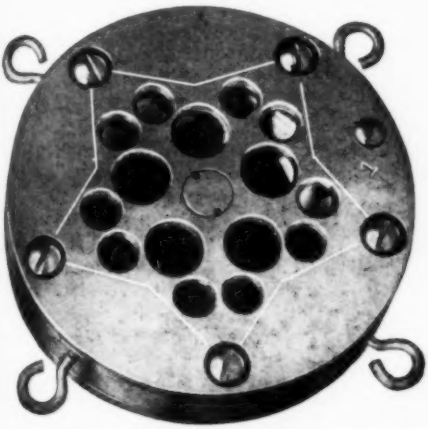
MODEL C



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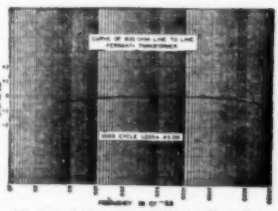

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SEE PAGE 61

for information you have long wanted to complete your back copy files.

Many of these copies will not be available six months from now.

Act promptly!

On the third Sunday, January 25th, things proceeded in more orderly fashion in the c.w. ranks. Only two messages show side-routes for this day.

No. 89HKZX32: VE3GT sent W4SS's message to W8CUG and to W8BAS. Both reached the coast, W8CUG's route doing the best as is clearly shown in the summary table. The W8BAS route was W8BAS-W8AKV-W9BBU - ? - W9OS-W9BAS-W9ENV-W9ESP-W9DTM-W9BCX-W5ARV-W6WV. W6WV did not start reply.

No. 58FIXV91 started by W1WV Brookline, Mass., reached the coast and a reply was received back from two different stations. W8CUG gave the reply to W3NF for relay to W1WV as shown in the table, and also to W1MK about two hours later. W1MK sent to W1TA from where it was passed to W1CHR in Brookline, Mass. W1CHR very easily QSPed the remaining short distance between W1WV and W1CHR.

That completes the side-routes as our records show them. We do not doubt for a minute but what there may be other routes we have not mentioned. The reports have received a great deal of study and we feel that the results as shown are unusually complete for an activity of this nature. If any one, who had a part in the relays on either the 'phone or c.w. side, has been left out, we are extremely sorry and would even at this late date appreciate his report so that we may complete the records. Believe us when we say that it took some mighty "tall" stepping to get as much information as we have.

CONCLUSION

If you have carefully read the story of the transcons and have examined the message routings, you have surely arrived at some decision regarding present-day relaying. Has it improved over that of several years ago? That is hard to say. In many ways, "Yes." We have definitely shown that we can put messages across the continent and replies back in *astounding* time — *32 mins.; 27 mins.; 9 mins.; 5 mins.; and even 2 mins.!!!* And they did *not* travel over pre-announced routes! According to 1921 *QST*, it was lucky in those days to get a message across *one way* even though pre-arranged routes had been designated for each message. What could we do to-day, if we definitely designated about five stations at strategic points across the country to relay a transcon message, and then announced the time that message would leave one of those five stations? Couldn't we beat that *2-minute* figure?

A Push-Pull A. C. Receiver

(*Continued from page 27*)

spacing to one-fourth inch. The coil specifications are given in the table below Fig. 6. All the detector grid coils are center-tapped for a clip connection to the plate choke of the r.f. stage.

OPERATION

There is nothing difficult in the operation of this receiver. The addition of a stage of tuned radio frequency makes two tuning controls, but this does not work any hardship on the traffic man who is used to a single control, since a range of about 100 kc. can be covered with the detector tuning condenser before readjustment of the r.f. tuning condenser is necessary. Bringing the r.f. stage in resonance with the detector stage increases the signals considerably, but the set is so sensitive that the r.f. stage can be considerably out of tune and still receive signals with considerable volume.

This receiver is suited for break in operation provided a master oscillator or a crystal circuit is not used. The transmitter at this station uses crystal control, and the crystal circuit running continuously, with 150 volts on the plate, effectively blocks the receiver when using an antenna 10 feet long for receiving. With a self-excited transmitter no trouble is had in this respect. A possible remedy would be to locate the antenna a distance from the receiver and use a shielded lead in.

The average amateur 'phone stations come in so loud that it is unpleasant to keep the 'phones on. A volume control, such as a variable resistor in the r.f. screen-grid lead, would probably work out to good advantage.

In operating this receiver the detector stage is set and the r.f. tuning is varied until the detector oscillates. If the receiver does not function, the tickler or the grid coil of the r.f. stage may need adjustment. A method of finding whether the grid coil of the r.f. or the tickler is at fault is to tune in some commercial station. These stations usually can be heard even with the detector not oscillating. If signals can be heard but the set will not oscillate, change the tickler; then if no signals are heard, change the r.f. grid coil. This failing, experimenting with the detector screen-grid voltage should be tried.

Although this receiver uses a fixed antenna coil, there is no reason why a variable antenna coil may not be used to advantage.

To the amateur who has a push-pull complex (like myself), here is a receiver that will do justice to any ham station.

Strays

Hard-drawn copper tubing can be made soft to facilitate winding coils by heating it in a hot fire or blow-torch flame until red-hot, then dropping it suddenly into cold water. The rapid cooling softens the copper and at the same time loosens the copper oxide coating which forms when the tubing is heated.

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